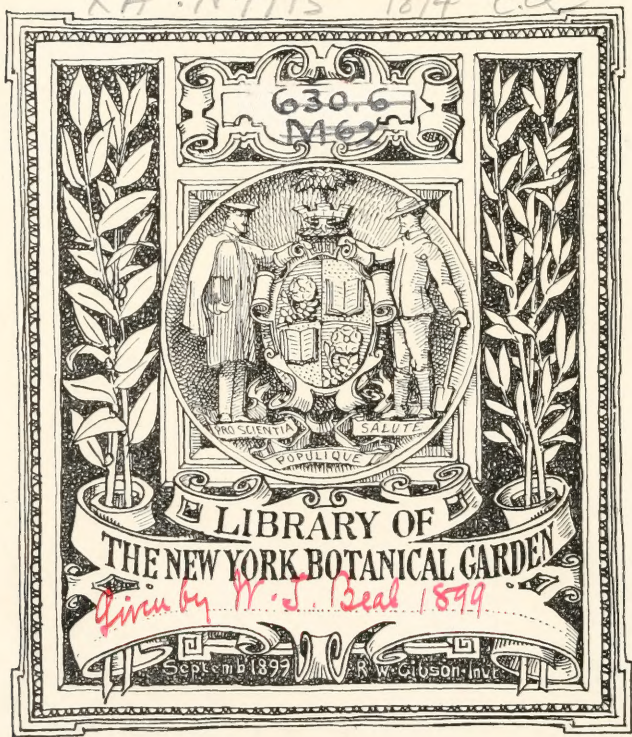


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FOURTH ANNUAL REPORT
OF THE
S E C R E T A R Y
OF THE
STATE POMOLOGICAL SOCIETY
OF
MICHIGAN.

1874.

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REPORT OF THE SECRETARY

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OF THE

MICHIGAN STATE POMOLOGICAL SOCIETY.

CASCADE, Kent Co., December 31, 1874.

To the Secretary of State:

SIR,—Section six of an act to provide for the incorporation of societies for the promotion of pomology, horticulture, and the kindred sciences and arts, in the State of Michigan, approved April 15, 1871, provides that “it shall be the duty of the Secretary of said State society to make and transmit to the Secretary of State a report of the transactions of said society, including copies of papers read at its meetings, reports of exhibitions held, and of facts collected by correspondence or otherwise, at the end of the month of December of each year, said report to be printed in similar form and number of copies as the reports and transactions of the State Board of Agriculture and State Agricultural Society, under the direction of the Secretary of State.”

In compliance with the above legal requisition, I respectfully submit for publication the accompanying Report for 1874, with supplementary papers.

J. P. THOMPSON,

Secretary of the Michigan State Pomological Society.

CONSTITUTION AND BY-LAWS

OF

THE MICHIGAN STATE POMOLOGICAL SOCIETY.

CONSTITUTION.

The constitution was adopted at the city of Grand Rapids, July 5, 1871.

At a meeting of the society, held May 7, 1872, at Grand Rapids, two amendments were adopted.

The first amendment struck out the article locating the office of the society in the city of Grand Rapids, Kent county.

The second amendment provided for a Vice President in each county, so far as may be deemed necessary or practical.

The following is a copy of the constitution as it stands, March 1, 1875:

*ARTICLE I.—OBJECT.

The object of the Society is to develop facts and promulgate information as to the best varieties of fruit for cultivation in the State of Michigan, and the best methods of cultivation.

†ARTICLE II.—OFFICERS.

The officers of the Society shall consist of a President, a Vice President in each county so far as may be deemed necessary or practical; a Secretary, and as many local Secretaries as may be deemed necessary; a treasurer, and an Executive Committee of six members, exclusive of the President, Secretary, and Treasurer, who shall be members *ex officio*. Of this committee four shall constitute a quorum for the transaction of business at any meeting of said committee: *Provided*, Each member shall have been notified in the usual manner of such meeting. All the above officers to be elected annually by bal-

*NOTE TO ARTICLE I.—It will be noticed that Article I. of the Constitution defines the object of the Society to be "to develop facts and promulgate information as to the best varieties of *fruit* for cultivation in the State of Michigan, and the best methods of cultivation." This means *Pomology*, which is the art or science of fruits, or of raising fruits. Various attempts have been made to extend or widen the name of the Society, meaning thereby to extend its object and aim.

By general consent it has come to be understood that the Society also embraces:

1st, *Horticulture*, or the art of cultivating gardens.

2d, *Floriculture*, or the art of cultivating flowering plants.

3d, *Arboriculture*, or the art of cultivating trees and shrubs, especially for ornamental purposes, as well as for timber. All these *kindred* arts and sciences are embraced in the annual premium list of the Society, and receive attention at all the meetings, so that instead of calling the Society "The Michigan State Pomological, Horticultural, Floricultural, and Arboricultural Society," it is simply called, for the sake of brevity and convenience, "The Michigan State Pomological Society."

†NOTE TO ARTICLE II.—It has happened that the Society has elected for Vice Presidents gentlemen who were not members of the Society. By general consent such elections are held to be null and void, and that it is not competent to elect a non-member to an office of the Society.

lot, except the Executive Committee, whose terms of office shall be so arranged that two vacancies shall occur annually.

ARTICLE III.—ANNUAL MEETING.

The annual meeting for the election of officers shall be on the first Tuesday in December in each year; the officers elected at such meeting to commence service on the first of January following.

ARTICLE IV.—EXPIRATION OF TERM OF OFFICE.

The officers shall remain and perform their respective duties until their successors are elected and have accepted, but the regular term of office shall expire on the 31st of December in each year.

ARTICLE V.—TIME OF HOLDING MEETINGS.

The Society may hold a meeting on the first Tuesday of each month, at such place as the Executive Committee shall designate.

ARTICLE VI.—MEMBERSHIP FEE.

Every person who subscribes, or who may subscribe to these articles, and pay to the Treasurer the sum of one dollar per annum in advance, shall be entitled to membership, unless otherwise voted at a regular meeting of the Society.

ARTICLE VII.—DISBURSEMENTS.

No money shall be disbursed except on an order signed by the President and countersigned by the Secretary by direction of the Executive Committee.

ARTICLE VIII.—AMENDMENTS.

These articles may be amended at any regular meeting of the Society, by a majority vote of such meeting, provided one month's notice shall have been given of such amendment.

ARTICLE IX.—AMOUNT OF PROPERTY.

The Society may hold personal and real estate to the amount of twenty thousand dollars.

ARTICLE X.—BY-LAWS.

By-Laws may be passed at any regular meeting, but a month's notice may be required.

ARTICLE XI.—TREASURER'S BONDS.

The Executive Committee shall require of the Treasurer such security as they may deem necessary for the safe keeping and proper disbursement of the funds of the Society in his hands.

BY - LAWS.

SECTION I—THE PRESIDENT.

1. The President shall be the executive officer of the Society and of the Executive Board.

2. He shall see that the rules and regulations of the Executive Board are duly observed and enforced, and in the absence of established rules touching

particular cases and when beyond the reach of the Executive Board, he shall have power to institute rules, by and with the consent of the Secretary, provided such rules be not in conflict with any established by the Board, subject, however, to the action of the Executive Board at its subsequent meeting.

3. In conjunction with the Secretary, the President shall prepare regularly an order of business for the meetings of the Society.

4. The President shall have the best interests of the Society at heart, and shall lead in forwarding any enterprise that shall add to the use or popularity of the Association, but shall not have power to act upon any important matter connected with the Society without first consulting the Executive Board.

SECTION II.—VICE PRESIDENTS.

Any one of the Vice Presidents shall, in the absence of the President, at any meeting, preside and perform the duties of said office.

SECTION III.—SECRETARY.

1. The Secretary shall be the recording, corresponding, financial, auditing, and accounting officer of this Society.

2. He shall attend all meetings of this Society and Executive Board, and shall keep an accurate and faithful record of the proceedings. He shall sign all certificates of membership, all awarded diplomas, and have charge of the Society's books and papers, and any other property given into his care by the Society, and shall be responsible for the same.

3. He shall also be custodian of the seal of the Society, and affix the same to all important documents.

4. He shall seek by every praiseworthy means to have the meetings of the Society announced in a public manner throughout the State, and shall use every endeavor to have the important proceedings of the Society, as well as the prominent papers, read before the meetings, published, and thus placed in the hands of all the interested inhabitants of the State.

5. It shall be his duty each year to prepare for publication the annual report, the same to contain an exact proceedings of the Society, and such other matter as shall be deemed proper by the Secretary, in conjunction with an advisory committee from the Executive Board.

SECTION IV.—TREASURER.

With the Treasurer shall be deposited all of the funds of the Society, and it shall be his duty to keep an accurate account of the income and disbursements of the Society, and shall be prepared to report the condition of the Society's finances, when called upon to do so by the Society or Executive Board.

SECTION V.—EXECUTIVE BOARD.

1. The Executive Board shall be the judicial body of the Society, and shall enact all laws, rules, and regulations for the government of the association, shall have full charge of the annual exposition, and shall fix the salaries of the officers.

2. The Board shall have power to displace any officer for neglected duty or abuse of position, and shall fill all vacancies by appointment. This Board shall have four regular meetings during the year, the times and places for the same to be settled by themselves. Other meetings may be called by the President, or a majority of the members of the Board.

3. This body shall consider it their duty to look after the general welfare of the Society; devise new methods of improvement; keep the Society upon a sound financial basis, and provide for every necessity as it shall arise.

4. All measures of importance shall be submitted to this Board, but may be referred back to the Society for final decision.

5. The Executive Board shall make out a report through the Secretary for each meeting of the Society following the regular or special meetings of the Board.

6. The election of the Executive Board shall be arranged as follows: Two members shall be elected for one year, two members for two years, and two members for three years, at the next annual election; after which two members shall be elected annually, the term of office being three years.

SECTION VI.—MEETINGS.

The Society shall have four regular meetings in the year, to be denominated quarterly sessions, the times and places to be decided upon by the Executive Board, they being guided by invitations sent in from different portions of the State.

SECTION VII.—AMENDMENTS, ADDITIONS, ETC.

Any addition or revision of these laws may be made by a two-thirds vote of the members present at any regular meeting of the Society, one month's notice having been given.

SECTION VIII.

This Society, in its regular or special meetings, shall be governed by ordinary parliamentary usages.

THE PAST, PRESENT, AND FUTURE OF MICHIGAN POMOLOGY.

INAUGURAL ADDRESS OF GEORGE PARMELEE, PRESIDENT OF THE
MICHIGAN STATE POMOLOGICAL SOCIETY.

GENTLEMEN :—There are hidden springs impelling the action of societies as well as of individuals.

The inspiration which dictated to the lamented A. J. Downing the first lines of his preface to "Fruits and Fruit Trees of America," is one of the elements which sustains the life of this Pomological Society. He thought he could "be pardoned for talking about fruit trees," because his hours spent in orchards and gardens took an additional charm from the presence of the noble Hudson, though it is begirt with barren mountains, giving to the voyager upon it the impression of "patches" to the little tillable spots which are the sites of its beautiful towns and scattering farms.

Here and there a little fruit amid barren mountain wastes had its effect upon him. The love of it, more than a money consideration, led him to initiate the great work which his brother has so well completed.

Is it strange, then, that Michigan, with near or quite a thousand miles of water front on its lower peninsula, with nearly continuous arable lands, forming almost a continent suitable for fruit production,—is it strange, I say, that this great State should contain a body of men who will undertake the work this Society is doing without a money compensation,—for the love of it?

All great unpaid labors have their compensation. Ours is in the practical knowledge which we borrow from each other, and the satisfaction of seeing the interests of Pomology advance as do all the great industries of the day.

I propose now to hold a check on the natural tendencies of the occasion to talk of the beautiful and the lovely in our theme, and to confine myself to the business side of the subject.

It is well to look over the field and see where our work lies: to see the needs of the present, and to appreciate our difficulties and our helps.

If nearly every acre of this great peninsula is suited to the production of some one or more of the valuable fruits of the temperate zone, we have a grand field to contemplate in taking our survey.

We cannot take time to particularize in the consideration of our long list of Michigan fruits and our thousand townships in which the business we try to

foster may become more or less practical; but there are general principles of great importance to which I invite your attention.

CLIMATE INFLUENCES PRODUCTION.

All wide differences of climate result in an equally wide difference of productions.

The valleys of the Amazon and of the Mississippi differ widely in climate, and the productions of the one are entirely strange to the other. To the denizens of the first, the trees, the shrubs, the flowers of the latter are new.

From the Hudson to the St. Johns of Florida the change is complete. Measuring these differences by the vegetable growths, we may say that every tree, shrub, and flower has its climatic home. With some the breadth of that home is great, but with every product there is a place of highest perfection. Every fruit and vegetable, as well as every tree, has its true home, and from this point all shade off with more and more imperfections as we approach the limits of their existence. Thus, the apple is not to be found growing with the orange, nor the orange with the apple. The palm cannot flourish with the birch, nor the birch with the palm. The potato and the plantain will not thrive together. Some trees and fruits bear a wider range of climate than others, but all are at home somewhere, and all are alien to some clime.

THE POWER OF CLIMATE.

It is, mainly, the power of climate and not of soil that holds each production to its own region. We cannot ship a vessel-load of orchard soil from the banks of the Hudson to Cuba and raise the Swart apple or the Esopus Spitzenberg. We must be content to leave each production to its proper place. And we will do well to remember that all great staples, in their home, are king. We know that cotton is king in the South, wheat is king in Minnesota, sugar in Cuba, oranges in Sicily, grapes in Portugal, and tea in China. People in all countries learn to make, by the aid of commerce, their own staple products their main sources of wealth. So, as the agriculture varies, the sources of wealth differ; there are regions for sugar, for cotton, for coffee, for rice, for wheat, corn, tobacco, potatoes; for apples, pears, plums, and grapes; for oranges, figs, and bananas; and in the natural home of each staple product it builds up the wealth of the country; and in regions where such products gain a prominence, there you find the most intelligence bearing upon their cultivation and marketing. If you wished to learn the art of cane-growing and sugar-making, you would go to Cuba or Louisiana; you would study orange culture in Sicily or Florida, rice-culture in the Carolinas or China. To post yourself on the production of coffee you would visit the countries which produce it successfully. So of the various spices, tropical fruits, and the fruits of temperate climes.

MINOR MODIFICATIONS OF CLIMATE.

Wherever the important products of the world have a climatic home, there they naturally and properly become specialties.

I have referred to the greater variations of climate and production.

There are lesser differences which sometimes have a great bearing on the value of productions: and some modifications by soil are, also, important. As the results of some of these minor modifications of climate we have the Sea Island cotton, the superior coffee of Arabia, and the better and higher-priced hops of England and California.

The exceedingly valuable wines of some vineyards of Europe afford a good illustration of the enhanced value of a product when a slight modification of climate is secured by favorable condition of soil. Among the soils of the most celebrated vineyards in various parts of Europe there is no identity of mineral composition; but, in that respect, a striking dissimilarity; their identity is in their uniform poverty. Their climatic advantage is due to airiness of their elevated situations. While these poverty-stricken hills grow a wine worth ten dollars per gallon, the rich valleys in sight grow a wine which sells for ten to twenty cents the gallon.

These are only a few of the products of which minor climatic differences greatly affect the value. Small variations of winter extremes determine the success or failure of many tree fruits; and, on the other hand, excessive summer heats stand in the way of the production of some fruits in regions where the character of the winters is not adverse. In none of the great continents are the central parts productive of the valuable fruits. The fruit regions of the world have their climates favorably modified by the influence of bodies of water. The exceptions to this rule are quite insignificant, and are generally owing to altitude.

SPECIALTIES.

Is there any reasonable objection to specialties in countries where favorable peculiarities fit them for the most profitable production? Is there any reasonable objection to the State of Michigan making the most out of what nature has done for her? If there is, it will be hard for her farmers to see it while the money profit stands prominently before their eyes. There is no such objection. With our unequaled water influences, with our location in the midst of the populous and wealthy Northern States, and with profitable markets open to us on all sides, we shall drift more and more into fruit production.

OUR FRUIT INTEREST

has already advanced to considerable proportions. Starting from the old Dousman apple orchard on Mackinaw Island, and the old French apple and pear trees on Detroit river, all seedlings, we have gone to net results of many millions. Within the memory of some of us here our present great interest has grown from nothing. We have passed the day of wild speculation in fruit lands, the "Belt" proving to be too wide a matter for monopoly, as, from center to circumference, various valuable fruits can be grown profitably. Our constantly increasing and cheapening transportation facilities are opening to us a great number of good markets.

Our best keeping apples can go to Europe in good condition, and to Louisiana or Texas, while the nearer Eastern and Western markets are ever ready to take the bulk of the crop.

Our peaches, pears, sweet cherries, and grapes do not have to go far for good markets, and the increasing demand will admit of a very great increase of production.

OUR ENEMIES.

We have gone far enough in fruit production to find an insect war upon our hands. This must be fought out. Fruit men and farmers generally are coming to the conclusion that injurious insects have had things too much their own way. To fight our enemies we must know them thoroughly. Here is our weak point. Every cultivator who has paid much attention to this great draw-

back finds it difficult to give the time necessary to post himself thoroughly, and he does not find the full knowledge, in books, which he desires. He feels that there should be, somewhere, a work initiated that shall improve our knowledge and facilitate our work of keeping down these enemies. Can such a work be done so effectually, so speedily, so cheaply, as by strengthening the entomological branch of the Agricultural College so as to allow the professor to give the main part of his time to investigations relating to economic entomology? In a matter of such vast importance it would seem that the State should undertake to do what individuals have, so far, mainly neglected. Every interest of the farm, orchard, and garden cries out for something to be done in this direction.

. OUR FAILURES, AND WHAT IS WANTED.

We have made some progress in fruit production, but there is need of much more, not alone in acreage, but in methods, in quality, and in varieties.

Good orchards in the State are paying more clear profit than any other branch of husbandry; but we have multitudes of trees and many orchards that are of no special value, and such are being planted every day.

One man said, "I would give five thousand dollars to-day if I could change my varieties." Another man says, "My orchard would be worth twenty thousand dollars more if it was of the best varieties." In another man's orchard one-fifth pays more than the other four-fifths.

Besides worthless varieties there are great numbers of trees that are nearly worthless by foolish pruning, rendering them incapable of carrying a heavy crop without splitting down.

Quite commonly good orchards are found in which most of the fruit is worthless from insect depredators.

These evils can be remedied.

Our Society does not expect to work miracles. We expect to labor patiently, and slowly and surely to benefit the Pomology of the State. We expect to add to our individual stock of practical knowledge, and hope to keep others from making again the mistakes which we have made.

And we hope to see, and believe we shall see, our fruit culture very largely and profitably extended.

We hope to see none of our farm products diminished, but we do expect to see our lumber production decrease. We believe that as the oak and the pine disappear they should be succeeded, to a great extent, by the apple, pear, plum, peach, or cherry tree.

As the heavy lumber trains disappear by forest exhaustion, products of the farm must freight those cars; and, as that result is reached, we expect to see long trains of the fruits in their season.

We expect to see fruit production a specialty. The outcry against specialties, where nature has made an adaptation, belongs to the past,—to the days when the commerce of the world was carried on in the insignificant galleys of the Mediterranean, and the land transportation was by pack horses or camels.

If the cheap transportation by sail and steam vessels and the railroads, of to-day enables you to produce and lay down your own product in other States cheaper than they can produce it, then that product, to you, may be a specialty.

The cheapening of transportation inevitably tends to specialties, and those

specialties result in wealth, the world over. We believe that in this industry there is a broad foundation for future wealth.

THE ADVANTAGES OF THE STATE.

Surely no State east of the Rocky Mountains has such an extended area suited to the production of first-class apples. And, with our nearness to non-producing regions, giving us the best of markets, and with our adaptation to the production of the other staple fruits of the temperate clime, we are not behind. We are surely favored beyond the adjoining States.

OUR FRIENDS.

Our Society needs the co-operation of all the intelligent fruit-growers in the State; we are steadily drawing them to our aid.

In some of the counties, the people have not had a convenient opportunity to meet with us, but wherever we have met we have gained valuable friends. We must keep what friends we have, and we want more.

We want friends and we want help, because we are reaching for grand results.

We work to see the aggregate acreage of fruit multiplied by a large figure; to see valuable sorts instead of worthless or indifferent ones; to see good management, such as shall result in heavy crops of the fairest fruit; to see trees pruned so as to be able to bear their burdens; to redeem from insects the millions of dollars that are now destroyed; to place the whole business of packing and shipping on an honest basis; to freight the long trains with Michigan fruit; and to see it one of the great money resources of the State.

We must not be afraid of new ideas: they are the foundation of all progress.

Pomological literature has its errors. We must try every theory by the test of practical results, and by that comparison it must stand or fall. This will make the teachings of our Society a valuable guide to the cultivators within our own borders.

The State itself suitably acknowledges the value of our work by publishing our report.

The State Agricultural Society takes a sensible view of the matter, and stands by us generously.

The State Agricultural College helps us cordially and well, as it has opportunity.

A large number of the best farmers and orchardists are heartily with us.

OUR PROSPECT

for another year's successful work seems to be good.

If love of the work is our mainspring of action, we very properly have an auxiliary to it in the pride we feel in the advancement of the State in wealth and its attendant blessings.

POPULAR AND VALUABLE VARIETIES OF FRUITS.

COMPILED FROM THE BEST AUTHORITIES, FOR THE USE OF THE MICHIGAN POMOLOGICAL SOCIETY.

We have no desire, and it is not our purpose or intention to encourage the planting and cultivation of a too extensive list of fruits. There are, already, too many varieties in use in this as well as in other States.

The list of Apples could profitably be reduced three-fourths, and then enough would be left for all useful purposes.

But there are many young beginners who are calling for catalogues of fruits and fruit trees, and they ask us to give them a list for reference in this Annual Report. We beg most earnestly to warn all new beginners in fruit culture to be cautious and not be misled by catalogues or lists. These, unintentionally, are often deceptive. The best way is first to consult the oldest and most experienced fruit growers in the immediate locality or neighborhood of your labors. The experience of such men is the best, because they know the soil and climatic influences with which you have to deal. The varieties that have succeeded with them are likely to succeed with you.

By all means beware of planting too large a number of summer and autumn varieties of apples. The State of Michigan is already overloaded with such, and if the hard winter of 1875 has thinned them out it will prove a good thing, for useful and profitable varieties can be put in their unprofitable space. The profit of Apple Culture is in the best long-keeping winter varieties, and to the WINTER APPLE we advise the apple culturist to turn his attention. Concentrate on a few leading valuable varieties, and there are but few of these, and they can be counted on your fingers. Consult the great standard works of Downing, Thomas, Barry, and Warder, and, especially, do not fail to consider carefully the list of fruits recommended by the Michigan State Pomological Society.

APPLES.

The eleven Summer Apples recommended by the Society are as follows:

Market—Early Harvest, Red Astrachan, Duchess of Oldenburgh (second quality), Maiden's Blush.

Family—Early Harvest, Red Astrachan, Primate, Large Yellow Bough, Maiden's Blush.

Amateur—Early Harvest, Carolina June (for the southwest), Sine Qua Non, Early Strawberry, Early Joe, Large Yellow Bough, Summer Rose (in certain localities).

The fifteen Autumn Apples recommended by the Society are as follows:

Market—Lowell, Porter, Keswick Codlin, Twenty Ounce.

Family—Lowell, Chenango Strawberry, Porter, Hawley, Dyer, Jersey Sweet, Blenheim Pippin, Twenty Ounce, Fall Pippin, Ohio Nonpareil, Haskell Sweet.

Amateur—Garden Royal, American Summer Pearmain, Chenango Strawberry, Autumn Swaar, Jersey Sweet, Hawley, Dyer, Haskell Sweet, Fall Pippin, Ohio Nonpareil.

The Winter Apples recommended by the Society are as follows:

Market—Jonathan, Peck's Pleasant, Rhode Island Greening, Baldwin, Red Canada, Golden Russet, Roxbury Russet (variably successful), Wagener, Northern Spy (for special localities).

Family—Belmont, Fameuse, Bailey Sweet, Westfield Seek-No-Further, Hubbardston Nonsuch, Peck's Pleasant, Northern Spy, Rhode Island Greening, King of Tompkins County (for special localities), Yellow Bellflower, Wagener, Baldwin, Talman Sweet, Red Canada, Ladies' Sweet, Golden Russet, Roxbury Russet (variably successful).

Amateur—Shiawassee Beauty, Bailey Sweet, Melon, Jonathan, Peck's Pleasant, Northern Spy, King of Tompkins County, Belmont, Hubbardston Nonsuch, Yellow Bellflower, Wagener, Rhode Island Greening, Grimes' Golden, Swaar, Esopus Spitzenberg, Red Canada, Ladies' Sweet, Golden Russet.

CLASS I.—SUMMER APPLES.

Astrachan Red—Large, roundish; nearly covered with deep crimson, over-spread with a thick bloom; juicy, rich, acid, beautiful. The tree is a vigorous grower, with large foliage, and a good bearer. August.

Benoni—Medium size, roundish, oblong; red; flesh tender, juicy, rich. Tree vigorous and erect; productive. August.

Bough, Large Sweet (Large Yellow Bough)—Large; pale yellow; sweet, tender, and juicy. Tree a moderate, compact grower, and abundant bearer. August.

Dechess of Oldenburg—A large, beautiful Russian apple; roundish; streaked red and yellow; tender, juicy, and pleasant. A kitchen apple of best quality, and esteemed by many for the dessert. Tree a vigorous, fine grower, and a young and abundant bearer. September. Succeeds well in the Northwest where most varieties fail. We place this variety on the list of summer apples, though many rate it an autumn sort.

Early Harvest (Yellow Harvest)—Medium to large size; pale yellow; tender, with a mild, fine flavor. Tree a moderate, erect grower, and a good bearer; a beautiful and excellent variety for both orchard and garden. Middle to end of August.

Early Strawberry (Red Strawberry)—Medium size; mostly covered with deep red; tender, almost melting, with a mild, fine flavor. Tree a moderate, erect grower, and a good bearer; a beautiful and excellent variety for both orchard and garden. Middle to end of August.

Early Joe—A beautiful and delicious, small-sized, deep-red apple. Tree

rather a slow, but upright grower, and a most profuse bearer; originated in Ontario county, N. Y. Last of August.

Early Pennock—Large; striped red and white. Tree hardy and productive; popular in the West. August and September.

Golden Sweeting—Large; yellow; a very fair, fine sweet apple. Tree a strong grower, spreading and irregular; a good bearer.

Maiden's Blush—Large; beautiful pale waxen yellow, blushed with brilliant crimson; acid, aromatic; an early, regular bearer, very productive. Tree vigorous and hardy; very popular. August to October.

Primate (Rough and Ready)—Medium size; pale yellow, with a blush on the sunny side; resembles *Summer Rose*; tender, mild, and good. Tree vigorous, and a good bearer. August and September.

Red June or Carolina Red—Small or medium; deep red; good; productive, hardy. Popular at the South and West. August.

Sine-quæ-Non—A native of Long Island, named by the late Wm. Prince. Fruit roundish conical, about medium size, smooth, pale greenish yellow. Stalk slender. Flesh white, very tender, juicy, and of a delicate and very sprightly flavor. Good. The young trees are rather slow and crooked in growth. August.—*Downing*.

Spice Sweet—Large, fine waxen yellow color; sweet, with a peculiar spicy flavor. August and September.

Summer Bellflower—A large, handsome, and excellent variety, from Dutchess county, N. Y.; resembles the Winter Yellow Bellflower; a good grower and bearer. August and September.

Summer Rose—Medium size, roundish; pale yellow, with a red cheek; tender and delicious; has a beautiful waxen appearance. Tree rather a slow grower, but a good bearer. Middle to end of August.

Sweet June (Hightop Sweet)—Medium size; yellow and red. Tree very hardy and productive. An Eastern variety, but popular in the West and South. Last of July.

Summer Queen—Large, conical; striped and clouded with red; rich and fine flavored. Tree grows rapidly, with a large, spreading, irregular head. August.

Sops of Wine—Medium size, oblong; dark crimson; flesh stained with red; juicy, sub-acid. Tree a fine grower, distinct, and quite productive. August and September.

Tetofsky—A very handsome Russian apple. Tree very vigorous and productive. July and August.

Williams' Favorite—Large, oblong; red, rich, and excellent; a moderate grower and good bearer; very highly esteemed in Massachusetts, especially around Boston, where it originated. August.

CLASS II.—AUTUMN APPLES.

American Summer Pearmain—Medium size, oblong; skin smooth, covered with streaks and dots of red; tender, juicy, and rich. Tree a slow but erect grower; bears early and abundantly. September; in use for several weeks.

Alexander—A very large and beautiful deep red or crimson apple, of medium quality. Tree vigorous and moderately productive. October and November.

Autumn Strawberry—Medium size, streaked light and dark red; tender, juicy, and fine. Tree vigorous, rather spreading, productive; one of the best of its season. September and October.

Autumn Bough—A large, beautiful, and excellent apple, resembling the Sweet Bough, but a month or six weeks later.

Blenheim Pippin—An old variety, originated at Woodstock, in Oxfordshire, England. Tree a strong and vigorous grower, a regular and abundant bearer. Fruit large, roundish oblate, conical, yellowish, becoming deep orange, stained on the sunny side with dull and dark red stripes. Stalk short and stout, in a deep cavity. Calyx large, open, in a deep, broad basin. Flesh yellow, breaking, very sweet, pleasant. Good. October, December. Valued mainly for cooking.

Cogswell—A large, beautiful striped apple, from Connecticut; of good quality, and productive. October and November.

Colvert—Large; greenish yellow, striped and shaded with dull red; tender, brisk sub-acid. Tree a strong grower and an enormous bearer. October and November.

Fall Pippin—Very large, roundish, oblong; yellow; flesh tender, rich, and delicious. Tree vigorous, spreading, and a fine bearer; esteemed generally. October to December.

Fall Jenneting—Large, oblate; pale greenish yellow, with a slight blush; flesh tender, juicy, and sub-acid. November.

Gravenstein—A very large, striped, roundish apple, of the *first quality*. Tree remarkably rapid, vigorous, and erect in growth, and very productive. September and October.

Haskell Sweet—Origin, farm of Deacon Haskell, Ipswich, Mass. Tree vigorous, upright, spreading, and productive. Young wood light grayish brown. Fruit medium or above, oblate. Color greenish yellow, sometimes with a blush. Stalk short, inserted in a rather broad, deep cavity. Calyx closed. Basin broad and large, of medium depth. Flesh yellowish, tender, juicy, very sweet, rich, aromatic. Very good to best. September, October.

Hawley—Large; waxy yellow, rarely blushed; very pleasant, mild, sub-acid, rich. August to September.

Hawthornden—A beautiful Scotch apple, medium to large size, pale yellow and red. Trees have strong shoots, with low, spreading heads; constant and abundant bearer; excellent for cooking. Resembles Maiden's Blush. September and October.

Jefferis—From Pennsylvania, medium to large, striped, mostly red; fine quality, productive. September and October.

Jersey Sweet—Medium size, striped red and green, tender, juicy, and sweet; a strong, fine grower, and good bearer; very popular, both for table and cooking. September and October.

Keswick Codlin—Large, oblong, pale yellow, acid. Excellent for cooking. July to October.

Lowell—Large; bright, waxy yellow, oily; flavor brisk, rich, sub-acid. Tree hardy and vigorous. September and October.

Munson's Sweet—Medium to large, pale yellow with a red cheek, tender, juicy, and good. Tree a very fine grower, and good bearer. October and November.

Ohio Nonpareil—Large to very large, smooth, yellow, covered with bright red, very handsome; flesh tender, juicy, fine grained, sub-acid, rich. First quality. September.

Porter—Medium size to large, oblong, yellow; flesh tender and of excellent flavor. Tree a moderate grower; very popular in Massachusetts. September.

Pomme Royal (Dyer)—Large, roundish, yellowish white, with a brown tinge next the sun; crisp, juicy, and high flavored. Tree a fair grower and abundant bearer. September and October.

Pumpkin Sweet (Pumpkin Russet)—A very large, round, yellowish russet apple, very sweet and rich. Tree a strong, rapid grower, with a large, spreading head; valuable. October and November.

St. Lawrence—Large, round, streaked red and greenish yellow; a very beautiful, productive, and popular market apple from Canada. October.

Chenango Strawberry—Large, oblong, red and yellow; handsome. Tree a fine grower, and very productive. September.

Twenty Ounce (Cayuga Red Streak)—Very large; greenish yellow, boldly splashed and marbled with stripes of purplish red; brisk sub-acid. A handsome, showy fruit. October and January.

Garden Royal—Fruit medium or below. Form roundish oblate, very slightly conic. Color greenish yellow, shaded, striped, and splashed with rich red, a little dull or grayish toward the stalk. Sprinkled with light and gray dots. Stalk medium, slender. Cavity deep, acute. Calyx open or partially closed. Segments sometimes a little re-curved. Basin shallow, slightly uneven. Flesh yellow, very tender, juicy, rich, mild, sub-acid, aromatic. Best. Core small. Last of August, September.

CLASS III.—WINTER APPLES.

Baldwin—Large, bright red, crisp, juicy, and rich. Tree very vigorous, upright, and productive; considered in Massachusetts the *best winter apple*; tender in some parts of Michigan. December to March.

Bailey Sweet—Very large, deep red; flesh tender, rich, and sweet; a superb and excellent sweet apple; originated in Wyoming county, N. Y. The tree is a vigorous, upright grower. November to January.

Bellflower (Bellefleur) *Yellow*—Large yellow, with a tinge of red on the sunny side; flesh crisp, juicy, with a sprightly aromatic flavor; a beautiful and excellent fruit. This desirable fruit is unfortunately an unreliable bearer. November to April.

Ben Davis (New York Pippin, Kentucky Streak, etc.)—A large, handsome, striped apple, of good quality. Tree very hardy, vigorous, and productive; a late keeper; highly esteemed in the West and Southwest.

Belmont (Gate)—Large, pale yellow, with a red cheek and distinct carmine dots; tender, mild, and fine flavored. Tree a fair grower, and very productive; succeeds very well in N. Ohio and W. New York. November to February.

Cooper's Market (Cooper's Redling)—Medium size, conical, red, handsome; quality good; a late keeper. Tree hardy and productive. December to May.

Dominie (Wells of Ohio)—A large, fine striped apple, resembling the Rambo; a fine grower and profuse bearer; succeeds very well in nearly all the Western States; attains a great size in Illinois and Iowa. December to April.

Fallwater (Faldenwalder, Tulpehocken, Pound, etc.)—A very large and handsome well marked apple, from Pennsylvania, quality good. Tree vigorous, bears young and abundant. November to March.

Fameuse (Snow)—Medium size, deep crimson, flesh snowy white, tender and delicious. Tree vigorous, with dark wood; a beautiful and fine fruit; succeeds particularly well in the North. November to January.

Green Sweeting—Medium size, greenish, tender, sweet, and spicy; one of

the very best long keeping sweet apples. Tree a moderate and erect grower. November to May.

Grimes' Golden (Grimes' Golden Pippin)—An apple of the highest quality, equal to the best Newtown Pippin; medium to large size, yellow. Tree hardy, vigorous, productive; originally from Virginia; grown in Southern Ohio. January to April.

Hubbardston Nonsuch—Large, striped yellow and red, tender, juicy, and fine; strong grower and great bearer. Native of Massachusetts. November to January.

Jonathan—Medium size, striped red and yellow; flesh tender, juicy, and rich, with much of the Spitzenburg character, shoots light colored, slender, and spreading; very productive; a native of Kingston, N. Y. November to April.

King (of Tompkins County)—A superb red apple, of the largest size and finest quality. Tree a good grower and bearer; hardy. November to March.

Lyman's Pumpkin Sweet (Pound Sweet)—A very large, round, greenish apple, excellent for baking. Tree one of the most vigorous and productive. October to December.

Lady Apple (Pomme d'Api)—A beautiful little dessert fruit; flat, pale yellow, with a brilliant red cheek; flesh crisp, juicy, and pleasant. The tree forms a dense, erect head, and bears large crops of fruit in clusters; the fruit sells for the highest price in New York, London, and Paris. November to May. There are four or five varieties of these described by authors, but this is the best.

Ladies' Sweet—Large, roundish, green and red, nearly quite red in the sun; sweet, sprightly, and perfumed; shoots slender but erect; a good bearer. Originated in Newburgh, N. Y. One of the best winter sweet apples. November to May.

Melon—Origin, East Bloomfield, N. Y. Tree of rather slow growth while young, a good bearer. Young shoots dull grayish reddish brown. One of the best and most valuable sorts for the dessert; a little too tender for shipping long distances.

Monmouth Pippin (Red Cheek Pippin)—Large, greenish yellow, with a fine red cheek; juicy, tender and good. Tree erect, vigorous, and productive. Keeps well till March or April.

Mother—Large, red, flesh very tender, rich, and aromatic. Tree a good bearer, succeeds well in the North; supposed to have originated in Worcester county, Mass. November to January.

Northern Spy—Large, striped, and quite covered on the sunny side with dark crimson, and delicately coated with bloom. Flesh juicy, rich, highly aromatic, retaining its freshness of flavor and appearance till July. The tree is a remarkably rapid, erect grower, and a great bearer; like all trees of the same habit, it requires good culture and an occasional thinning out of the branches, to admit the sun and air fully to the fruit. Both leaf and blossom buds open a week later than most other varieties.—*From Barry & Ellwanger's Catalogue.*

Newtown Pippin—One of the most celebrated of American apples, on account of its long-keeping and excellent qualities, and the high price it commands abroad; but its success is confined to certain districts and soils. It attains its greatest perfection on Long Island and on the Hudson. In Western New York and New England it rarely succeeds well. It requires rich and

high culture. Tree a slow, feeble grower, with rough bark. November to June.

Ortley (White Detroit, White Bellflower, Warren Pippin, Jersey Greening, Woolman's Long, etc.)—A large, oblong apple, of the first quality; succeeds well in the West. Tree erect, vigorous, and productive. December to March.

Peck's Pleasant—Large, pale yellow, with a brown cheek; very smooth and fair; flesh firm and rich, approaching the flavor of a Newtown Pippin. Tree erect and a good bearer. November to April.

Pomme Grise—Small, grayish russet; very rich and highly flavored. Tree a moderate grower but good bearer; very valuable in the North; is frequently shipped from Canada to England. November to April.

Pawpaw (Western Baldwin, Rubicon, Ball Apple)—Origin, Pawpaw, Mich. Tree hardy, a good and regular bearer. Young shoots dull grayish reddish brown. A new apple, esteemed in its place of origin for its productiveness and beauty of appearance. Fruit medium, roundish oblong, slightly oblique, yellow, shaded, and mostly overspread with bright rich red, faintly splashed and mottled, moderately sprinkled with areole dots. Stalk medium. Cavity deep, narrow. Calyx partially open. Segments a little re-curved. Flesh yellowish, juicy, firm, rich, brisk, subacid. Very good. December to June.*—*Downing*.

Rawle's Genet (Rawle's Janet, Never Fail, etc.)—Medium to large size; yellow, striped with red; crisp, juicy, rich; a prolific bearer. One of the most popular winter apples in the South and Southwest.

Rambo—Medium size; streaked and mottled yellow and red; tender, juicy, mild flavored. Tree a good grower and bearer. A widely cultivated and esteemed old variety. Autumn in the South; October to December in the North.

Reinette, Canada—Very large; flattened, ribbed; dull yellow; flesh firm, juicy, and rich. Tree a strong grower, spreading, and good bearer. In France it is considered the largest and best apple, and proves excellent here. November to March.

Red Canada (Old Nonsuch of Massachusetts)—Medium size; red with white dots; flesh rich; subacid and delicious. Tree a slender grower. One of the best apples. November to May.

Rhode Island Greening—Everywhere well known and popular; tree spreading and vigorous; always more or less crooked in the nursery; a great and constant bearer in nearly all soils and situations; fruit rather acid, but excellent for dessert and cooking. Towards the South it ripens in the fall, but in the North keeps well until March or April.

Ribston Pippin—Large; striped yellow and red; crisp, juicy, sprightly. Tree spreading and productive. October or November. A celebrated English apple; succeeds well in the most Northern localities.

Russet, Golden—Medium size, dull russet, with a tinge of red on the exposed side; flesh greenish; crisp, juicy, and high flavored. Tree a fine grower, with light colored speckled shoots, by which it is easily known; bears well; popular, and extensively grown in Western New York. November to April.

Russet, English—Medium size; greenish yellow russet; flesh crisp, with a pleasant subacid flavor. Tree stout and upright; a certain and exceedingly productive bearer. Keeps till June.

NOTE.—At the Battle Creek meeting of the State Society it was voted to call this apple the Rubicon.

Russet, Roxbury or Boston—Medium size to large; surface rough; greenish, covered with russet. Tree vigorous, spreading, and a great bearer. Keeps till June. Its great popularity is owing to its productiveness and long keeping.

Swaar—Large; pale lemon yellow, with dark dots; flesh tender, rich, and spicy. Tree a moderate grower, with dark shoots and large gray buds; with good culture it is one of the very best of apples. November to May.

Seek-no-further (Westfield)—Medium to large; striped with dull red, and slightly russeted; flesh tender, rich, and excellent. Tree a good grower, and fruit always fair. November to February.

Shiawassee Beauty—Originated in Shiawassee county, Michigan. Tree a strong, upright grower, until in full bearing, when it becomes partially pendent; very productive. Young wood dull reddish brown, slightly downy. This variety resembles Fameuse, but its wood shows its distinctiveness. —*From Downing's Fruit and Fruit Trees of America.*

Spitzenburg, Esopus—Large; deep red, with gray spots, and delicately coated with bloom; flesh yellow, crisp, rich, and excellent. Tree rather a feeble, slow grower, and moderate bearer; esteemed in this State as one of the very best. November to April.

Tolman's Sweeting—Medium size; pale, whitish yellow, slightly tinged with red; flesh firm, rich, and very sweet; excellent for cooking. Tree vigorous, upright, and very productive. November to April.

Vandevere (Newtown Spitzenburg of the West)—Medium size; yellow, striped with red, and becoming deep crimson next the sun; flesh yellow, rich, and fine. Tree a fair grower and good bearer; succeeds best on light, warm, dry soils. October to March.

Wagener—Medium to large size; deep red in the sun; flesh firm; subacid and excellent. Tree very productive; an excellent variety, introduced from Penn Yan, Yates county, N. Y. December to May.

Winesap—Large; roundish; deep red; medium quality; keeps well. Tree a fair grower and good bearer; succeeds well in the West, and is there valuable and popular. December to May.

Willow Twig—Large; roundish, striped; quality good. Tree very hardy, and a great bearer. Keeps well. A valuable orchard variety in some parts of the West. December to May.

White Winter Pearmain—Large, oblong; pale yellow; beautiful and very good. Tree a good grower, hardy and productive. Highly esteemed at the West and Southwest. January to April.

VARIETIES RECOMMENDED AS DWARFS.

Summer—Red Astrachan, Red June, Early Harvest, Sops of Wine, Duchess of Oldenburg.

Autumn—Gravenstein, Maiden's Blush.

Winter—Baldwin, King of Tompkins County, Lady Apple, Northern Spy, Esopus Spitzenburg, Winesap, Wagener.

CIDER CRABS.

Hewes' Virginia Crab—The Virginia crab makes a very high-flavored cider, which by connoisseurs is thought unsurpassed in flavor by any other, and retains its soundness a long time. It is a prodigious bearer, and the tree is very hardy, though of small size. Fruit small, dull red streaked with greenish yellow; flavor acid, rough, and astringent.

Red Crab—Similar to the preceding in qualities for cider, but is of larger size.

Wagh's Crab—Similar to Hewes' Crab; superior to it in size, but not as large as the Red Crab. The trees of this variety are the strongest and most upright in growth.

SIBERIAN CRABS AND IMPROVED SIBERIAN APPLES.

The varieties of Siberian Crab Apples (*Pyrus baccata*) have heretofore been mainly valued for their handsome flowers and the beautiful appearance of the tree when loaded with fruit. Within the past year or two, however, considerable attention has been given to their cultivation by fruit growers in our Western and Northwestern States, because of the superior hardihood of the trees. Large numbers of seedlings have been grown, some bearing full evidence of the paternity of the *Pyrus baccata*, others possessing more or less of the *Pyrus malus*, apparent more in the flesh and improved quality of the fruit than in the habit of the trees. They are all valuable for cider, preserves, and cooking, and some of the improved varieties, more truly perhaps, Siberian Apples, are quite pleasant, and rich for the dessert. The great hardihood of the trees, and their productiveness, make them highly valuable for sections where the better varieties of the *Pyrus malus* do not succeed. In description of these varieties the terms, "medium, large, or small," must be considered as applied in comparison with the Siberian Crab.—*From Downing's Fruit and Fruit Trees of America.*

Hyslop Crab—Large; produced in clusters; dark, rich red covered with a thick, blue bloom; flesh yellowish; good for culinary uses and cider.

Red Siberian Crab—Small, about an inch in diameter; yellow, with scarlet cheek; beautiful. Tree is vigorous and erect; bears when two or three years old. September and October.

Large Red Siberian Crab—Large; skin pale red and yellow; highly esteemed for preserving. September and October.

Large Yellow Siberian Crab (Golden Beauty)—Fruit similar in size to the foregoing; light clear yellow, often inclining to amber, with a warm cheek. September and October.

Marengo—Large; bright red on yellow ground; flesh yellowish white, crisp, juicy, a little harsh until fully ripe, when it is a mild and pleasant subacid. Early winter and late spring.

Montreal Beauty—This is one of the most beautiful of all Crabs in appearance. Large; bright yellow, mostly covered and shaded with red; flesh yellowish, rich, firm, acid. September to October.

Oblonga—Fruit elongated, conic; light yellow, almost white, marbled and striped with crimson and carmine, and covered with a thin bloom. The most beautiful of all the Crabs.

Transcendant—Medium to large; golden yellow, with a rich crimson red cheek in the sun, covered with a delicate white bloom; when nearly ripe the red nearly covers the whole surface; subacid; when fully mellow it is pleasant and agreeable. Early autumn.

CHERRIES.

The cherry succeeds well on dry soils, and is susceptible of being trained in any form that taste or circumstance may require.

For orchards, where there is ample room for large trees, and in climates

where it is not subject to the bursting of the bark, standards with four or five feet of clean trunk are preferable.

For door yards, where shade and ornament are taken into account, standards of the free-growing sorts, with erect habit and large foliage, are the most suitable.

For fruit gardens, and particularly those of moderate extent, and in localities where the bark of the trunk is liable to bursting, the pyramidal or conical trees, dwarf or low standards, with two or three feet of trunk, and the dwarfs, branching within a foot of the ground, are the most appropriate and profitable.—*Barry*.

The hardiest cherries are the Kentish (or Early Richmond), the Dukes, and the Morellos. These succeed well at the farthest limits, both North and South, in which the cherry can be raised; and when all other varieties fail, they may be depended upon for regular crops.—*Downing*.

The classes known as the Heart and Bigarreau cherries (rapid-growing trees, with large foliage and sweet fruit), do not, however, succeed uniformly well in all parts of the country. Especially is this true in some parts of the West and South, owing to the body of the tree cracking, exuding a gum, and often dying outright before it attains to a bearing size. The cause of this difficulty arises chiefly, if not altogether, from the fact that in our rich, alluvial soils there is a tendency to over-luxuriance in growth. Anything, therefore, that checks this tendency will be conducive to the longevity and productiveness of this tree.—*Igenfritz*.

The Kentish (or Early Richmond) is the hardiest, most productive and regular bearer of all cherries. While it is not first-rate in flavor, its other unrivaled qualities make it the most popular variety in cultivation.

The cherries recommended by the Society are as follows:

Market—Kentish (or Early Richmond), Louis Phillippe, May-duke, Belle Magnifique.

Family—Kentish, May-duke, Louis Phillippe, Belle Magnifique.

Amateur—Early Purple Guigne, Kentish, May-duke, Reine Hortense, Belle de Choisy, Late Duke, Louis Phillippe, Belle Magnifique.

Mr. Parmelee, Chairman of Committee on Cherries at the Ionia meeting, reported the following list for cultivation: For hardy varieties—Kentish (or Early Richmond), English Morello, Reine Hortense, May-duke, Belle Magnifique. Less hardy varieties—Early Purple Guigne, Elton, Yellow Spanish, Rockport, Black Eagle, Knight's Early Black.

CLASS I.—HEART CHERRIES.

Fruit heart-shaped, with tender, sweet flesh. Tree of rapid growth, with large, soft, drooping leaves.

Black Eagle—Large, black; tender, juicy, rich, and high flavored. Tree a rapid, stout grower, and productive. Ripe beginning of July.

Black Tartarian—Very large; purplish black; half tender; flavor mild and pleasant. Tree a remarkably vigorous, erect, and beautiful grower, and an immense bearer. Ripe last of June and beginning of July. One of the most popular varieties in all parts of the country.

Belle d'Orleans—An early French variety; medium size; pale red and white; tender and delicious. Tree a fine grower and bearer. Ripens just after Early Purple.

Coe's Transparent—Medium size; pale amber, red and mottled next the sun; tender, sweet, and fine. End of June here. Tree vigorous and erect.

Downer's Late Red—Rather large; light red, tender, and juicy; slightly bitter before fully ripe. Tree a vigorous, erect grower, and productive. Late.

Early Purple Guigne—Small to medium size; purple; tender, juicy, and sweet. Growth slender and spreading. First to middle of June.

Elton—Large, pointed; pale yellow, nearly covered with light red; half tender, juicy, rich, and delicious. Tree vigorous, spreading, and irregular. End of June.

Gov. Wood—The finest of Dr. Kirtland's seedlings of Ohio; clear, light red; tender and delicious. Tree a good grower and most productive. End of June. Hangs well on the tree.

Knight's Early Black—Large, black; tender, juicy, rich, and excellent. Tree vigorous and very productive, branches spreading. Ripe a few days before the Black Tartarian.

Sparhawk's Honey—Medium size, roundish; light red, tender, sweet, and delicious; stones large. Tree a vigorous, pyramidal grower, and very productive. Ripens with Downer's Late, and hangs long on the tree. A great favorite with most people.

White French Guigne (probably the "*Merisier a gros fruit blanc*" of the French)—A distinct and beautiful cherry, rather large, creamy white; flesh tender and melting; juice colorless, sweet, with a scarcely perceptible degree of bitterness; not attacked by birds, like red and black cherries. Tree is vigorous and very productive. Middle of July.

Wilkinson—Medium size, black; tender, juicy, and rich. Tree vigorous, erect, and productive; ripens late. Succeeds Downer's.

CLASS II.—BIGARREAU CHERRIES.

These are chiefly distinguished from the preceding class by their firmer flesh. Their growth is vigorous, branches spreading, and foliage luxuriant, soft, and drooping.

Bigarreau, or Yellow Spanish—Large; pale yellow, with a bright red cheek in the sun; flesh firm, juicy, and delicious; one of the best, most beautiful, and popular of all light colored cherries. Tree vigorous and productive. End of June.

Buttner's Yellow—Medium size; pale yellow; flesh crisp, juicy, and sweet. Tree vigorous and productive. Its peculiar and beautiful color makes this sort desirable. End of July.

Black Hawk (Dr. Kirtland)—A large, firm, black cherry, resembling the Black Eagle, but earlier, and much firmer.

Cleveland Bigarreau (Dr. Kirtland)—Large; clear red and yellow, juicy, sweet, and rich. Tree fine grower, spreading, and productive. Early.

Gridley, or Apple Cherry—Medium size; dark brown, nearly black; flesh very firm, sprightly, subacid, high flavored. Tree grows rapidly and erect, and bears immense crops. Its firmness and lateness make it very valuable for market. Middle to last of July.

Monstreuse de Mezel (Great Bigarreau)—A French variety; very large, dark brown, firm. Tree vigorous, spreading, irregular. Middle of July.

Napoleon Bigarreau—A magnificent cherry of the largest size; pale yellow, with a bright red cheek; flesh very firm, juicy, and sweet. Tree is a vigorous grower, and bears enormous crops. Beginning of July.

Rockport Bigarreau (Dr. Kirtland)—Large; pale amber in the shade, light red in the sun; half tender, sweet, and good. Tree remarkably vigorous, erect, and beautiful. Ripe same time as Black Tartarian.

Tradescant's Black Heart (Elkhorn)—Very large, black; very firm, juicy, and good. Tree vigorous and upright, with peculiar gray bark. A great bearer, and so late as to be very valuable. Middle and last of July.

CLASS III.—DUKE AND MORELLO CHERRIES.

These two classes of cherries are very distinct from the preceding. The trees are of smaller size, and grow more slowly; the leaves are thicker and more erect, and of a deeper green. The fruit is generally round, and in color varying from light red, like Belle de Choisy, to dark brown, like May-duke or Morello.

The Dukes have stout, erect branches, usually, and some of them, like Belle de Choisy and Reine Hortense, quite sweet fruit; while the Morellos have slender, spreading branches, and acid fruit invariably. These two classes are peculiarly appropriate for dwarfs and pyramids, on the Mahaleb stock, and their hardiness renders them well worthy of attention in localities where the Heart and Bigarreau are too tender.—*Barry*.

Belle de Choisy—Medium size; amber-shaded and mottled with red; tender, melting, sweet, and rich; rather a shy bearer. Tree makes a pretty pyramid. End of June.

Belle Magnifique—A magnificent, large red, late cherry, excellent for cooking and fine for table when fully ripe; rather acid, tender, juicy, and rich. Tree a slow grower, but a most profuse bearer; makes a fine dwarf or pyramid on the Mahaleb. Last of July. Very valuable.

Carnation—Large; light red, mottled with orange; tender, juicy, a little acid, rich, and excellent. Tree is a good grower and profuse bearer; makes a fine dwarf. Middle and last of July. Very valuable.

Donna Maria—Medium size; dark red; tender, juicy, rich, acid; fine for cooking. Tree small; very prolific. Supposed to be identical with "Early May" of the West. Middle of July.

Early Richmond, or Montmorency—An early red, acid cherry; very valuable for cooking early in the season. Ripens through June.

Guigne Noir Luisante—Large; dark brown, nearly black; beautiful, acid, rich. Tree small, erect; moderate bearer. Late; last of July.

Jeffries' Duke—Medium size; red, tender, subacid; branches erect and stiff; makes a beautiful pyramid. Middle of June.

Late Kentish (Common Red)—Medium; dark, lively red when fully ripe; abounding with a highly acid juice. Middle of July. This is the common *Pie Cherry* of the country, and although not as popular as formerly, on account of its growing disposition to unfruitfulness, it still retains favor because of its hardiness and estimable culinary qualities.

Late Duke—Large; light red; late and excellent. Tree makes a nice dwarf or pyramid. End of July. Valuable.

May-duke—An old, well known, excellent variety; large; dark red; juicy, subacid, rich. Tree hardy, vigorous, and fruitful; ripens a long time in succession; fine for dwarfs and pyramids. Middle of June.

Morello English—Large; dark red, nearly black; tender, juicy, subacid, rich. Tree small and slender; makes a fine bush on the Mahaleb. If trained on a north wall it may be in use all the month of August. Valuable.

Montmorency Ordinaire—A beautiful large, red, acid cherry; very hardy; ripe middle to end of July.

Plumstone Morello—Large, dark red; rich and fine; the best of all the Morellos. Tree a slender, slow grower; makes a nice bush on the Mahaleb. July and August. Valuable.

Reine Hortense (Monstreuse de Bayay)—A French cherry of great excellence; large, bright red; tender, juicy, nearly sweet, and delicious. Tree vigorous, and bears well; makes a beautiful pyramid.

Royal Duke—One of the largest and finest of this class; ripens after May-duke.

PEARS.

The pears recommended by the Society are as follows:

SUMMER.

Market—Madelaine, Osband's Summer, Tyson.

Family—Madelaine, Doyenne d'Ete, Bloodgood.

Amateur—Madelaine, Doyenne d'Ete, Bloodgood, Beurre Giffard, Tyson, Rostiezer.

AUTUMN.

Market—Sterling (especially adapted to light soils), Bartlett, Buffum, Flemish Beauty, Seckel, Onondaga, White Doyenne (for certain localities), Beurre d'Anjou.

Family—Clapp's Favorite, Sterling, Bartlett, Seckel, Flemish Beauty, Onondaga, Beurre d'Anjou, Sheldon.

Amateur—Clapp's Favorite, Bartlett, Washington, Seckel, Fondante d'Autonne (or Belle Lucrative), Beurre Bose, White Doyenne, Sheldon, Beurre d'Anjou.

WINTER.

Market—Beurre Gris d'Hiver Nouveau, Lawrence, Beurre Diel.

Family—Lawrence, Beurre Diel.

Amateur—Winter Nellis, Beurre Diel, Beurre Gris d'Hiver Nouveau, Lawrence.

The pear very justly ranks as one of the most delicious fruits of modern times. It has been placed first by nearly all modern amateurs, on account of its fine, juicy texture, exquisite flavor and aroma. Of late years more attention has been given to the cultivation of this favorite fruit, and those who have entered upon its cultivation for market intelligently, have found it to be one of the most profitable employments.

In the standard form the pear undoubtedly succeeds the best and with the least care. When once well established in a favorable soil and situation, it requires but little attention. An occasional cultivation of the soil about the tree and a light pruning is all that is necessary to insure its success.

Soil.—The soil most congenial to this fruit tree is a strong, clay loam, but will succeed in any good soil, provided it is moderately rich, and dry. A soil saturated with stagnant moisture for a large portion of the year, is totally unfit for this purpose.

Distance.—The usual distance at which to plant standard trees is about twenty-five feet, each way. If the soil is not very strong, twenty feet is sufficient.

Selection of Trees for Transplanting.—Owing to the pear not making many

fibrous roots, the planter will find it to his interest to select small, thrifty trees, two or three years old, and from four to six feet high. Such trees, if properly planted on good soil, can hardly fail to do well, while older and larger trees are more liable to suffer injury from the operation of digging and transplanting.

Dwarf Pears.—These are budded on the Anger's quince, which is the best stock for this purpose. In favorable localities, and with careful culture, they are often made to yield good crops: but for general cultivation we would recommend the standard tree.

Picking and Ripening.—Early and autumn pears should be picked ten days before fully ripe, and allowed to ripen in the house. This greatly improves the flavor of nearly all kinds, while some are nearly worthless if allowed to ripen on the tree. Winter pears should be picked before severe frosts, and placed in a cool cellar, till it is desired to ripen them; when if placed in drawers in a warm room they will ripen in a few days.—*I. E. Ilgenfritz & Co.*

Thin the Fruit.—When pear trees are heavily laden with fruit, they should be thinned when about *one-third* grown; else the fruit will be poor and the trees injured.—*Patrick Barry.*

CLASS I.—SUMMER PEARS.

Beurre Giffard—An excellent variety, larger and better than the Madeleine, and ripening shortly after it. Tree slender, but healthy; hardy; a free grower, and very productive.

Bloodgood—An American pear of the first quality; medium size; buttery, melting, and rich. Tree a fair grower and good bearer. August.

Doyenne d'Ete (Summer Doyenne)—A beautiful, melting, sweet pear, rather small. Tree a fine grower and bearer. First of August.

Dearborn's Seedling—Rather below medium size; pale yellow; melting and delicious. Tree a rapid, fine grower, and bears young and profusely; one of the very best early summer pears: ripe immediately after the Bloodgood. About the last of August.

Edmunds—Introduced by Barry & Ellwanger. Fruit large, roundish, stalk very long; skin smooth, pale lemon yellow; flesh fine-grained, buttery, melting, with a peculiar, delicate, agreeable aroma. Tree a very strong, upright, handsome grower, and an abundant bearer. Succeeds well on the quince. September.

Madeleine (Citron des Carmes)—One of the earliest of fine pears; ripe last of July and first of August; melting and sweet. Tree a fine grower and very productive.

Osband's Summer—A medium-sized, excellent fruit; melting, mild, and pleasant-flavored. Tree a fair, erect grower, and very productive. Middle of August. Origin in Wayne county, New York.

Rostiezer—Medium size; yellowish green, with a brown cheek; flesh juicy, sweet, and high-flavored. The tree is vigorous, with dark-colored shoots; of German origin. August.

Tyson—Rather above medium size; melting, juicy, sweet, and fine-flavored. Tree a very vigorous and rapid grower; one of the finest summer varieties. Origin, Jenkintown, Pa. August.

CLASS II.—SELECT AUTUMN PEARS.

Barthlett—One of the most popular pears: large, buttery, and melting, with

a rich, musky flavor. A good erect grower; bears young and abundantly. Middle to last of September.

Brandywine—Medium size; yellow and russet; melting, high-flavored, first-rate. A free grower and productive. August.

Buffum—Resembles the White Doyenne; buttery, sweet, and fine-flavored. Tree remarkably vigorous, upright grower; productive. Last of September.

Beurre d'Anjou—Fruit large; skin greenish, sprinkled with russet, sometimes shaded with dull crimson; flesh whitish, melting, with a brisk, vinous flavor. Tree a fine grower and good bearer. October and November.

Beurre Bosc—A large and beautiful russety pear; very distinct, with a long neck; melting, or nearly so, high-flavored and delicious. A good grower, though rather irregular, and bears well. September and October.

Beurre Hardy—A pear of good size; cinnamon russet; melting and fine. Tree a very strong grower and good bearer. October.

Beurre Superfin—A large, fine, melting pear, of sprightly, subacid flavor, like the old Brown Beurre, which is superseded. October.

Beurre de Waterloo (Fondante de Charneu, Duc de Brabant, Desire Van Mons, etc.)—A large, handsome pear, of first quality, of a honeyed sweetness, and delicate perfume. A good grower and bearer. October.

Belle Lucrative (Fondante d'Automne)—Large; melting and delicious. A fair, upright grower, and bears early and abundantly; first quality in all respects. September and October.

Clapp's Favorite—A splendid pear, resembling the Bartlett, ripening a few days earlier; a cross between that variety and the Flemish Beauty; tree resembles the latter.

Conseiller de la Cour (Marechal de la Cour, Duc d'Orleans)—A splendid, large fruit, of fine quality, ripening in November. Tree vigorous, and succeeds well on the quince.

Duchesse d'Angouleme—The largest of all our good pears. It attains its highest perfection on the quince, and is a beautiful and vigorous tree. October and November.

Doyenne Boussock—A large pear of good quality, resembling the White Doyenne. Tree a strong, rapid grower, and abundant bearer. Should be picked early. September.

Doyenne White—A well-known and almost universally esteemed variety, of the highest excellence. Tree a vigorous grower, productive, and hardy; succeeds well in most parts of the West; but cracks, and is no longer reliable in New York and the Eastern States.

Doyenne Gray—Similar in quality to the preceding; fruit of a reddish russet color. Tree not quite so strong a grower.

Flemish Beauty—A large, beautiful, melting, sweet pear. Tree vigorous and fruitful; succeeds well in most parts of the country. September and October.

Howell—One of the finest American pears; large, handsome; sweet, melting. Tree very vigorous, hardy, and productive. September and October.

Louise Bonne de Jersey (Bonne Louise d'Avranche)—A large, beautiful, first-rate pear; yellow, with a dark red cheek; melting, buttery, and rich. Tree a rapid, erect grower, and most abundant bearer; best on the quince. Should be in all collections. September and October.

Napoleon—A large, juicy, melting, fine fruit. Tree vigorous, hardy, and productive; bears young, ripens in November, and may be kept till December.

Onondaga (Swan's Orange)—A very large, melting, sprightly, high-flavored pear, sometimes slightly astringent. Tree vigorous, hardy, and extremely productive. October and November.

Paradise d'Automne—A large, fine, russet fruit: melting: first quality: resembling *Beurre Bosc*. Tree vigorous, but irregular: bears well. October.

Paul Ambre—Medium to large size: beautiful and excellent, resembling the *Beurre d'Anjou* in texture. Tree vigorous and very productive.

Seckel—The standard of excellence in the pear; small, but of the highest flavor. Tree a stout, slow, erect grower. September and October.

Sheldon—A pear of the very first quality, from Wayne county, New York: large, round; russet and red: melting, rich, and delicious. Tree erect and handsome, and bears well. October and November.

Stevens' Genesee—A large, roundish, handsome, melting pear. Tree vigorous and highly productive. September and October.

Sterling—Origin, Livingston county, New York; grown from seed brought from Connecticut. Tree vigorous, upright. Young wood grayish-yellowish brown; an early bearer and productive. Fruit medium, nearly round, slightly oval, very obscurely pyriform. Flesh rather coarse, juicy, melting, with a very sugary, brisk flavor. Good to very good. Ripens last of August and first of September.

Urbaniste (*Beurre Picquery* of the French)—A large, melting, buttery pear of first quality. Tree a moderate, compact, beautiful grower. October to November.

Washington—A beautiful American pear, of very excellent quality, which is a native of Delaware. It was discovered there in a thorn hedge, near Naaman's Creek, on the estate of Colonel Robinson. It is one of the most attractive and distinct of our native dessert pears. Young shoots slender, diverging, reddish-yellow brown. Fruit of medium size, oval-obovate, regularly formed. Flesh white, very juicy, melting, sweet, and agreeable. Very good. Middle of September.

CLASS III.—SELECT AUTUMN AND EARLY WINTER PEARS.

Beurre d'Anjou (*Nec Plus Meuris* of the French)—A large, fine pear, buttery and melting, with sprightly vinous flavor. Tree a fine grower and good bearer.

Beurre Diel—One of the largest pears; buttery, rich, and fine; sometimes gritty at the core on pear stock; generally first-rate on the quince. Growth very strong and rapid, with large, roundish leaves.

Beurre Langelier—Large; greenish yellow and red; melting and fine. Tree a superb grower; not an early bearer.

Beurre Clargeau—Very large, pyriform; yellow and red; texture of *Beurre Bosc*. Nearly melting, high-flavored. Tree a good grower, and an early, abundant bearer; a magnificent market fruit; one of the finest acquisitions.

Boyerne du Comice—A large, fine, new, melting pear; originated in Angers, France. Tree hardy, and a fine grower; succeeds well on the quince. Regarded as one of the best foreign varieties introduced during the last twenty years.

Dana's Hovey—Small, but of very fine quality, and keeps well. Named after Mr. C. M. Hovey, of Boston.

Emile d'Heyst—A large, pyramidal fruit, of the first quality. Tree vigorous; a great bearer and good keeper.

Lawrence—Size medium to large, obovate; golden yellow; flesh melting, with a rich, aromatic flavor. Tree a moderate grower and an abundant bearer. The most valuable of all our early winter pears.

Mt. Vernon—A vigorous grower and early bearer; fruit medium to large; juicy and melting. November and December.

Oswego Beurre—From Oswego, N. Y. Medium size, round; russet; melting, with a rich vinous flavor. Tree very hardy and productive.

Souvenir d'Esperen—A fine, late autumn pear, resembling the Winter Nelis in appearance and quality.

Winter Nelis—One of the best early winter pears; medium size; greenish russet; melting and buttery, with a rich, sprightly flavor. Tree a slender, straggling, but free grower.

CLASS IV.—SELECT LATE WINTER PEARS.

Beurre Easter (Doyenne d'Hiver of the French)—A large, roundish, oval fruit, yellow, with a red cheek; melting and rich. Tree a good grower and most abundant bearer; best on the quince; keeps all winter. One of the best-keeping table pears we have yet tested.

Beurre Gris d'Hiver Nouveau—A large, melting, first-rate early winter fruit. Tree a moderate and irregular grower, but good bearer. Keeps till February.

Bezy Sanspareil—Medium to large; roundish; yellow; melting, sweet, and good. Keeps well till February or March. Tree vigorous, very erect, and productive.

Bergamote d'Esperen—Promises to be one of the most valuable keeping pears. Tree a fine grower. December to January.

Columbia—An American variety; large, melting; fair quality. Tree a fine grower and good bearer. December to January.

Doyenne d'Hiver d'Alencon, or Nouveau—A long-keeping variety, resembling the Easter Beurre. Tree vigorous, and makes a beautiful pyramid on the quince; an abundant bearer.

Glout Moreau—A large, excellent, melting pear. Tree forms a perfect and beautiful pyramid on the quince, but needs to be five or six years old even on the quince before it yields a crop of fine pears; very distinct in wood, foliage, and habit. December and January.

Jamiette—Large, roundish; russety; half-melting; good. Tree one of the most vigorous and beautiful, with large, rich, glossy leaves. January and February.

Josephine de Malines—Medium to large size, roundish; pale straw color; flesh rose colored; melting and delicately perfumed; first quality. Tree a moderate grower, with small leaves; fruit borne in clusters; succeeds well on the quince, though not a handsome grower. This variety improves as the tree advances in age. One of the most delicious of our long-keeping table pears.

Pound (Angora, Uvedales St. Germain, etc.)—A monstrous fruit, and very beautiful; yellow, with red cheek. Tree very vigorous and productive. For stewing.

Vicar of Winkfield, or Le Cure—A large, long pear, fair and handsome, of good quality when well grown; if tree is overloaded and specimens small, they are worthless. Tree a beautiful, vigorous grower, and very productive.

FOR CULTIVATION ON THE QUINCE.

The following varieties are particularly recommended for cultivation on the

quince. All are vigorous and handsome growers, hardy, and bear well.—*Barry.*

Summer—Beurre Giffard, Brandywine, Tyson, Osband's Summer, Edmunds, Clapp's Favorite.

Autumn—Belle Lucrative, Urbaniste, Duchesse d'Angouleme, Beurre d'Anjou, Doyenne Boussock, Beurre Diel, Buffum, Beurre Langelier, White Doyenne, Beurre Superfin, Louise Bonne de Jersey, Howell.

Winter—Easter Beurre, Glout Morceau, Vicar of Winkfield, Jaminette, Doyenne d'Alencon, Lawrence, Josephine de Malines.

PEACHES.

To secure healthy, vigorous, and fruitful trees, and fine fruit, the following points must be well attended to in peach culture: 1st. Keep the ground clean and mellow around the trees, and give it an occasional dressing of wood ashes. 2d. Keep the heads low—the trunks ought not to exceed three feet in height. 3d. Attend regularly every spring to pruning and shortening the shoots of the previous year's growth. This keeps the head round, full, and well furnished with bearing wood. Cut weak shoots back about one-half, and strong ones one-third; but see that you have a sufficient supply of fruit buds. Sickly and superfluous shoots should be cut out clean. It should always be borne in mind that the fruit is borne on wood of the last season's growth, and hence the necessity for keeping up a good supply of vigorous annual shoots all over the tree. The plum stock is advantageous in stiff clay, cold, and damp soils.

—*Barry.*

The peach borer, a white grub about three-fourths of an inch long, frequently does a great deal of injury to this tree by girdling and devouring the bark just below the surface. Its presence may be discovered by removing a few inches of the soil, where will be found a sort of gum, mixed with the castings of the grub, resembling saw-dust. It is then easily removed and destroyed. A half peck of air-slacked lime or leached ashes placed around the trunk of the tree in May, and allowed to remain until October, affords a good protection against the depredations of this pest. In the cultivation of the peach we would recommend the shortening-in system. This should be done in February or March. Cut off from one-third to one-fourth of the previous year's growth. This course should be pursued every year. There is a great difference, in the appearance at least, between those that have been shortened in and those that have been left to themselves. The trees so treated live longer, are broken down less by the wind, produce larger and better fruit, which is more easily gathered than from trees grown by the old method.—*Ilgenfritz.*

The peaches recommended by the Society are as follows:

Market—Hale's Early (dry soil and open exposure), Wheeler's Early, Coolidge's Favorite, Honest John (of Michigan), Crawford's Early, Barnard (of Thomas), Old Mixon Free, Jacques' Rareripec, Crawford's Late (on clay), Hill's Chili, Smock Free (southern lake shore), Keyport White (southern lake shore), Stump the World, Foster (of Downing).

Family—Hale's Early, Coolidge's Favorite, White Imperial, Barnard (of Thomas), Honest John (of Michigan), Crawford's Early, Old Mixon Free, Crawford's Late, Hill's Chili, Smock Free.

NOTE BY SECRETARY.—It must be recollected that the shortening-in process, recommended by Mr. Barry and others, is entirely discarded by the most extensive peach-growers of Michigan.

Amateur—Hale's Early, Serrate Early York, Coolidge's Favorite, Grosse Mignonne, Large Early York, George the Fourth, Crawford's Early, Barnard (of Thomas), Old Mixon Free, Old Mixon Cling, White Imperial, Late Red Rareripec, Crawford's Late, Hill's Chili, Davis' Late (local name), Keyport White (local name), Tippecanoe Cling.

Barnard (Early Barnard, Yellow Barnard)—Rather large, roundish, suture distinct, mostly covered with dark brownish red; flesh deep yellow, red at stone, juicy, rich, very good. Tree hardy and a great bearer. Flowers small. This is a seedling of the Yellow Alberge, which it much exceeds in quality. September.—*J. J. Thomas*.

Bergen's Yellow—A large, yellow-fleshed peach of the finest quality, but a moderate bearer. Beginning of September.

Cole's Early Red—Medium size: mostly clouded and mottled with red; flesh pale, juicy, rich, and delicious. Tree vigorous and an abundant bearer. Middle of August.

Coolidge's Favorite—A most beautiful and excellent peach: skin white, delicately mottled with red; flesh pale, juicy, and rich. Tree vigorous and productive. End of August.

Crawford's Early—A magnificent, large, yellow peach, of good quality. Tree exceedingly vigorous and prolific; its size, beauty, and productiveness make it one of the most popular orchard varieties. Beginning of September.

Crawford's Late Melocoton (Crawford's Superb)—Really a superb yellow peach; very large, productive, and good; ripening here about the close of the peach season. Last of September.

Early York (Early Purple, Serrate Early York, etc.)—Medium size; on young, thrifty trees large; greenish white, covered in the sun with dull purplish red; flesh juicy, rich, and excellent. Tree a fair grower and very prolific; one of the best early orchard varieties. Middle of August.

Early Tillotson—Medium to large; white and red; flesh white, melting, and rich; one of the best varieties, but the tree and fruit are both liable to mildew badly. Same season as Early York.

Foster—A new, very large peach. Originated in Medford, Mass. Resembles the Early Crawford in appearance, but is much larger and somewhat earlier. Tree as hardy and productive as that well known sort; has received the highest encomiums from Massachusetts horticulturists.

George the Fourth—Large; white, with a red cheek; flesh pale, juicy, and rich. Tree vigorous, and bears moderate crops of the best quality. End of August.

Grosse Mignonne—Large; dull white with a red cheek; flesh pale, juicy, with a rich, vinous flavor; a free grower and good bearer. In England it is called "the best peach in cultivation." End of August.

Haine's Early—Large; white, with a red cheek; flesh pale, juicy, and delicious. Tree hardy and very productive; one of the best varieties. Middle of August.

Hale's Early—Raised in Ohio; medium size; flesh white, first quality; ripens rather earlier than the Early York.

Heath Free—A large, late peach, of medium quality. Succeeds well in some places.

Heath Cling—Very large; creamy white: an excellent late variety; popular in the South, where it succeeds well.

Honest John—Fruit large; skin pale yellowish white, dark red cheek on one side; flesh pale, marked with red at stone. Last of August. Freestone.

Jacques' Rareripe—A superb yellow peach, fully as large and as good as Crawford's Early, and ripening a week or ten days later.

Large Early York—A large and beautiful variety; white, with a red cheek; flesh juicy and delicious. Tree vigorous and productive; one of the very best. End of August.

Late Red Rareripe—Fruit large; skin fine pale greenish white, with lively red cheek; flesh pale greenish white, quite red at the stone, with a sweet and rich flavor. Last of August. Freestone.

Lemon Cling—A very large and beautiful lemon-shaped variety; light yellow, reddened in the sun; flesh yellow, rich, and vinous; excellent for preserving. Tree hardy and productive. End of September.

Monstrous of Douay—A large, French variety, of great excellence; nearly all red; melting and rich. End of September. Tree very robust and prolific.

Morris White—Medium size; dull creamy white, tinged with red in the sun; flesh white to the stone, juicy and delicious. Tree a moderate bearer; highly prized for preserving, on account of the entire absence of red in the flesh. Middle of September.

Mountain Rose—Large; bright red; very handsome; good. One of the best early peaches. July and August. Freestone. The Mountain Rose is highly recommended by Mr. Thomas Archer, and other fruit-growers, at St. Joseph.

Old Mixon Freestone—Large; greenish white and red; flesh pale, juicy, and rich. Tree hardy and productive; a standard orchard variety. Middle of September.

Old Mixon Cling—Very large and excellent; one of the finest clings. End of September.

Red Cheek Melocoton—A famous, old, well known, and popular variety; large, oval; yellow, with a red cheek; flesh yellow, juicy, rich, and vinous. Tree very hardy and prolific; valuable for the orchard. Middle to end of September.

Snow Peach—A beautiful fruit, medium size; skin and flesh clear creamy white throughout. Tree hardy and productive; blossoms white and shoots greenish; very distinct, and one of the most desirable of white peaches for preserving. Beginning to middle of September.

Scott's Nonpareil—A very large and fine yellow peach, from New Jersey. Highly esteemed as a valuable market variety. Middle to end of September.

Stump the World—A New Jersey variety; red and white; handsome, good size, and fair quality. Very productive. End of September.

Smock Free—A late, hardy, productive peach; valuable for the orchard at Cleveland and west of that. October.

Surpasse Melocoton—A large, pale-yellow-fleshed peach of the highest quality. A strong grower, and productive; raised by us from seed. First to middle of September.—*Ellwanger & Barry*.

Susquehanna—A very large and superb yellow peach from Pennsylvania; melting, rich, and fine. End of September.

Troth's Early—An early, white-fleshed peach, resembling the Large Early York. Of the same season.

White Imperial—Rather large; whitish yellow, reddened in the sun; juicy, sweet, and delicate; good grower and moderate bearer. Last of September.

Wheeler's Early—Is a good grower and hardy, except that it is quite as subject to curled leaf as any seedling. It is extremely liable to overbear; the fruit is medium size, of very bright appearance, fair quality, quite exempt from rot, and ships well.

Tipecanoe Cling—A large and handsome clingstone, originated by George Thomas, of Philadelphia. Its lateness and beauty render it a valuable kind. Leaves with reniform glands; flowers small; the shoots dark purplish red; fruit very large, nearly round, a little compressed on the sides, skin yellow, with a fine red cheek; flesh yellow, juicy, with a good vinous flavor. It ripens from the 20th to the last of September.

RIVERS' SEEDLING PEACHES (ENGLISH).

The following, raised from seed by Mr. Rivers, the eminent fruit-grower and nursery-man of Sawbridgeworth, England, are highly recommended. We subjoin his description of them.—*Ellwanger & Barry*.

Comet—Large, nearly round; orange, with a crimson cheek; melting, sweet, and good; ripens early in October.

Crimson Galande—Medium size, often large; deep crimson; flesh tender, melting, rich, and deliciously flavored; a freestone peach of the most hardy, prolific, and vigorous habit; middle to end of August.

Dagmar—Large; melting and rich; skin very downy, and of a deep crimson; very handsome. Ripe early in August.

Dr. Hogg—Large; firm, yet melting; often stained with red under the skin; flavor rich and sugary. A freestone peach. Hardy, vigorous, and prolific. Middle of August.

Early Albert—Large; nearly oval; melting and excellent. Succeeds the Early York peach.

Early Alfred—Above medium size; melting, and peculiarly rich and agreeable. A most delicious freestone peach. Early in August.

Early Beatrice—Medium size, with a marbled red cheek; flesh melting and very juicy; flowers large; glands small, kidney-shaped. This remarkably early peach was raised from a stone of my seedling White Nectarine, and is the earliest sort known.

Early Leopold—Medium size; pale yellow and red; very rich and excellent; glands kidney-shaped; flowers small. Succeeds Early Rivers.

Early Louise—Medium size; bright red, melting, very juicy and excellent. This is nearly as early as Early Beatrice.

Early Rivers—Large; color pale straw, with a delicate pink cheek; flesh melting, or rather dissolving, with a rich, racy flavor most remarkable. Ripens three or four days after Early Louise.

Early Silver—Very large; melting and rich, with the vinous flavor of the White Nectarine, its parent. Early in August.

Lady Palmerston—Large; melting and very good; skin greenish yellow, marbled with crimson; very handsome; flesh pale yellow. This fine peach ripens toward the end of September, and is a most distinct variety.

Large Early Mignonne—Very large; pale straw, with a rosy cheek. Ripens first week in August; melting and very rich.

Lord Palmerston—Very large, the largest of peaches; skin creamy white, with a pink cheek; flesh firm, yet melting, very juicy and rich. Season from middle to end of September.

Magdala—Size medium, shape inclined to oval, skin nearly smooth, like a

nectarine; color creamy white, marbled and blotched with crimson; flavor a combination of the peach and nectarine; quite original and exquisite. Season middle to end of August.

Prince of Wales—Very large; color deep crimson; melting, rich, and excellent; a very fine peach. Middle of September.

Princess of Wales—Very large; one of the largest peaches known, and one of the most beautiful, its color cream, with a rosy cheek; melting, rich, and excellent.

Rivers' Early York—Medium size; skin marbled with red; flesh so melting and juicy as to dissolve in the mouth, leaving no fibre. Season early in August.

The Nectarine Peach—Very large; pointed, with a smooth, nectarine-like skin; flesh melting, rich, and racy. Season the middle of September.

PLUMS.

DISEASES AND ENEMIES OF THE PLUM.

The prevalence of that disease of the plum commonly called the "black knot," and of the insect known as the *curculio*, has of late discouraged people generally from giving to the plum its merited share of attention. It is not to be denied that these are obstacles of considerable magnitude to indifferent, slovenly cultivators; but we are satisfied, from actual experience, that nothing more than ordinary industry and perseverance is required to overcome them entirely. Western New York is not exempt from these difficulties, any more than other localities; we hear complaints about "knots" and "curculio" all around us; yet we are able to fruit, in the most successful manner, some 70 or 80 varieties of plums annually, getting not merely a few scattering fruits, but *full crops*, weighing down the branches, as all will acknowledge who have seen our trees.

This success of ours is not due to any extraordinary skill, nor to any peculiarity of soil or climate, but to *reasonably good care and culture*.

Nothing is more favorable to the growth of the black fungus, or knot, than *neglect*. We have seen trees growing in grass in some uncultivated door yards transformed into a mere mass of black knots, while trees in neighboring gardens, under good cultivation, were entirely exempt. In our specimen plum orchard we have never lost a tree by this disease; it does occasionally make its appearance, but we instantly remove it. Our preventives and remedies are *good, clean culture, and prompt amputation*.

As for the *curculio*, we find no difficulty in protecting the crop from it, by merely employing a little extra labor. When the trees blossom, and as the fruit begins to set, we dress the ground about the plum trees, and make it very clean and smooth. Then as soon as the *curculio* commences its operations, we spread a large sheet, prepared for the purpose, around each tree, and jar it so as to shake down all fruits that have been stung, as well as all the *curculios*. Both insects and stung fruits are destroyed, and the ground is swept as clean as a floor. This work is performed *daily*, and insures a full crop. The work is done quickly; a dozen trees in a garden can be attended to daily in less than half an hour's work of a man. Let those who really desire to grow fine crops of delicious plums try this system, and *follow it up rigidly*, and they will be successful.—*Barry & Ellwanger*.

Should the insects be very abundant, they may be destroyed by throwing

them into a pail of hot water, or better still, into a small tin vessel of kerosene, by varying the contrivance as follows: Instead of the stiffeners across the ends, formed by single rods, let them be two short rods, meeting in the middle. When the middle rod is pulled out these will form a sort of hinge, so that the two sides of the sheet may be folded up like the covers of a book, and the insects thrown down into the trough thus formed, and thence into the vessel. In dislodging the insects from the tree, much depends on a sharp, stunning blow. It may be given by the stroke of a mallet, upon the short stump of one of the smaller limbs, sawed off for this purpose, and which prevents bruising the bark. Or a mallet may be thickly covered with woollen cloth encased in India-rubber, to prevent injury to the tree; but the jar is less sudden in this case. The late David Thomas (who first proposed jarring down on sheets), in a communication to the *Genesee Farmer*, in 1832, says: "Not three days ago I saw that many of the plums were punctured, and began to suspect that *shaking* the tree was not sufficient. Under a tree in a remote part of a fruit garden, having spread the sheets, I therefore made the following experiment: On *shaking it well*, I caught *five* curculios; on *jarring it with the hand*, I caught *twelve* more; and on *striking the tree with a stone*, *eight* more dropped on the sheets. I was now convinced that I had been in an error; and calling in the necessary assistance, and using a hammer to jar the tree violently, we caught in less than an hour more than two hundred and sixty of these insects." With large trees, it may be necessary to jar each limb separately, by means of a pole.

The best time for this work is in the cool of the morning, when the insects are partly torpid with cold, and drop quickly. At mid-day they retain their hold more tenaciously, and more quickly escape. The work should be commenced very early in the season, as soon as the fruit begins to set, or is not larger than a small pea. With properly stiffened muslin frames, a few minutes are sufficient for many trees, and labor equal in the aggregate to that of a single entire day may save large and valuable crops.

The time required to attain a sufficient size for the orchard varies much with different sorts. The Imperial Gage, the Washington, Huling's Superb, and others, grow rapidly, and usually produce good trees in two years from the graft or bud; while such slow-growing plums as the Primordian, Green Gage, and Red Diaper require a longer period.

Soil.—The best soil, usually, is a strong, rich, clayey loam. On many light soils the tree grows with less vigor, independently of which the crop is more frequently destroyed by the curculio, a pervious soil affording a more ready place of shelter for the young insects, on their escape from the fallen fruit. A few varieties are well adapted to rather dry as well as light lands.

In planting orchards, a suitable distance is one rod apart, giving one hundred and sixty trees to the acre. The ground should be manured and kept well cultivated, as the plum, especially when young, is sensitive to the effects of the weeds and grass of neglected culture.—*J. J. Thomas.*

STANDARD PLUM TREES.

These are generally four to five feet in height, and like all the stone fruits should have heads near the ground, making what we term *dwarf or low standards*.

DWARF AND PYRAMIDAL PLUM TREES.

These are adapted to garden culture, being just as easily grown in the bush or pyramidal form as the pear or cherry.

The plums recommended by the Society are as follows:

Market—Washington, Lombard, Duane's Purple, Yellow Egg, Coe's Golden Drop, Canada Egg (local).

Family—Sheldon, Washington, Prince's Yellow Egg, Coe's Golden Drop, Bavay's Green Gage, Canada Egg (local).

Amateur—Green Gage, Huling's Superb, Columbia, Jefferson, Imperial Gage, McLaughlin, Coe's Golden Drop, Bavay's Green Gage, Canada Egg (local).

Bradshaw (Large Black Imperial)—A very large and fine early plum; dark violet red; juicy and good. Tree erect and vigorous; very productive.

Bryanstone Gage—An English plum of excellent quality; greenish yellow; sweet. Tree of great vigor, and productive.

Bleeker's Gage—Above medium size; roundish oval; yellowish; flesh yellow, juicy, and rich; parts from the stone. Tree a fair grower and productive. Last of August.

Coe's Golden Drop—Large and handsome; oval; light yellow; flesh firm, rich, and sweet; adheres to the stone. Tree a fair grower, and very productive. Valuable not only on account of its large size and fine appearance, but its lateness. Last of September.

Duane's Purple—Very large and handsome; oval; reddish purple; flesh juicy and sweet; adheres to the stone. Tree a good grower and very productive. Beginning of September.

Fellemborg—A fine, late plum; oval; purple; flesh juicy and delicious; parts from the stone; fine for drying. Tree very productive. September.

Green Gage—Small, but of the highest excellence. Tree a slow grower. September.

General Hand—Very large; yellow, handsome; parts freely from the stone. Tree very vigorous and productive. September.

Goliath (Nectarine)—A very large, purple plum, rivaling the peach in beauty; second quality; strong grower and great bearer. Beginning of September.

German Prune—Medium; oval; purple or blue; juicy, rich, fine. Tree very productive. September.

Imperial Gage—Rather large; oval; greenish; flesh juicy, rich, and delicious; parts from the stone. One of the best growers; most productive and best of plums. Middle of August.

Jefferson—A fine American variety; yellow, with a red cheek; flesh orange-colored, juicy, and rich; parts from the stone. Tree a slow, poor grower, but productive. End of August.

Lawrence's Favorite—Rather large, roundish; yellowish green; flesh juicy, melting, and rich; parts from the stone. Tree vigorous and very productive. Middle and end of August.

Lombard—Medium size, oval; violet red; flesh yellow, juicy, and pleasant. A great bearer, and peculiarly well adapted to light soils. September.

Lucombe's Nonsuch—An English variety of rather large size; roundish; yellowish green, distinctly streaked with yellow and orange. A good grower and very prolific. Middle to end of August.

Monroe Gage—Rather above medium size, oblong oval; greenish yellow; flesh juicy, with a very rich, sugary flavor. Tree vigorous and productive. September.

Magnum Bonum, Yellow—A very large and beautiful egg-shaped yellow plum; a little coarse, but excellent for cooking. Tree vigorous and very productive. End of August.

McLaughlin—Large, round; greenish yellow; sugary and fine, first-rate. End of August.

Ontario—A seedling of ours; large, roundish; yellow-marbled; adheres to the stone; of good quality and very productive; ripe early in August.

Orleans, Smith's—A large and excellent variety; oval; reddish purple, with a thick coat of bloom; flesh yellow, firm, juicy and rich. Tree vigorous and very productive. August and September.

Peter's Yellow Gage—Large, nearly oval; bright marbled yellow; flesh rich and juicy; very good. September.

Prince Englebert—Very large and long; deep purple; rich and excellent; from Belgium. End of August.

Pond's Seedling, or Font Hill—A magnificent English plum; form of *Magnum Bonum*; light red, changing to violet; flesh rather coarse. Tree a good grower, and most abundant bearer. One of the most attractive in cultivation. September.

Prune D'Agen, or Robe De Sergeant—A French variety; first quality for drying. Tree very prolific. September.

Reine Claude De Bavay, (Esperen)—One of the best foreign varieties, as large as the Washington, and of fine flavor; roundish oval; greenish, marked with red in the sun. Tree vigorous and remarkably productive. Middle to end of September. Hangs long on the tree.

Shropshire Damson—A medium sized, dark purple variety, esteemed for preserving. October.

St. Lawrence—A seedling of ours, from Smith's Orleans; superior in size and quality to the parent. Large; dark purple; cling; ripens middle of August.

Victoria (Sharp's Emperor)—One of the most magnificent plums in cultivation; of the largest size; fair quality; purplish red color. Tree a strong, irregular grower, and most abundant bearer. September.

Wangenheim—Medium size; dark blue, oval; quality excellent; one of the finest of that class designated as *prunes*.

Washington—A magnificent large plum, roundish; green, usually marked with red; juicy, sweet and good. Tree vigorous and exceedingly productive; one of the very best. End of August.

Yellow Gage—Large, yellow, oval; flesh yellow, juicy and rich. Tree remarkably vigorous and productive. An excellent and profitable variety. Middle of August.

IMPROVED NATIVE PLUMS.

BY W. F. HEIKES OF DAYTON, OHIO.

The ravages of the *curculio* have of late years increased to such an extent as to cause the almost total failure of the crops of the finer varieties of plums. Notwithstanding all the remedies advocated to prevent the *curculio* from destroying the fruit, this insect has proven too strong in numbers; and excepting in a few isolated cases, where unusual pains have been taken to guard against

this pest, the labor required to grow a few plums is worth more than the result. Our native varieties, such as the *Chickasaw* and others, being less liable to be injured by the *curculio*, have induced several horticulturists to experiment with them in order to produce improved varieties, which would at least possess one great advantage over European varieties, in being *curculio*-proof. The *Chickasaw* type has furnished the best material to experiment with: its offsprings are all very vigorous growers and abundant bearers. We name a few of the most meritorious:

Wild Goose—Originated in Davidson county, Tenn. Its name is claimed to have been derived from the fact that a pit of a plum was found in the crop of a wild goose, and being planted produced this variety. Other stories, equally unfounded, give it a different origin. The fruit is large, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches long, $1\frac{1}{4}$ broad; color bright vermilion red, with numerous minute white dots towards the apex; stalk very slender, short; flesh rather coarse, juicy, vinous and pleasant. Compared with the finer foreign varieties can be classed as second-rate in quality. Tree very vigorous; leaves light green; very productive; maturity beginning of June. * * * As a market fruit it is very desirable, combining fine size, beautiful color and good quality. * * * *

Newmans—Another offspring of the *Chickasaw*. Fruit medium, oblong; smaller than the foregoing. Color bright vermilion. Flesh rather coarse, juicy, and with a pleasant vinous flavor. Adheres to the stone. * * Tree vigorous. * * * Foliage smaller than the *Wild Goose*. In fertility it is truly astonishing, and its fruit ripens about July 10th, lasting until the middle of August. It can not compare in point of quality with the best foreign varieties, but it is sufficiently good to merit extensive cultivation. Besides, it is perfectly free from insects and ripens at a period unusual for this class of fruit, —remaining in season nearly six months.”—*P. J. Berchmans, in Farmer and Gardener.*

Langsdon—Identical with the cherry plum, except that it is more than a month later in ripening: the cherry plum ripening the last of July, while the *Langsdon* ripens in September. It differs from the *Miner* in being more globular, with a longer stem and having a deep suture, which gives it the appearance of a very large cherry. The thick, tough skin common to this species renders it nearly *curculio*-proof. There are one or more orchards of the *Langsdon* near Louisville which are very profitable: all plums being out of season they sell for eight to ten dollars per bushel in that market, and will bear shipping to the most distant markets.—*D. L. Adair, in Journal of Horticulture.*

Miner—This is also an improved variety of the *Chickasaw*, claiming the same advantages in being exempt from the attacks of the *curculio* as the above varieties. Medium in size; dark, purplish red, with a fine bloom. In quality is similar to the foregoing. September.

Cherry (Early Scarlet, etc.)—The origin of this species is in some doubt, and while it may not prove to be a native variety, its freedom from the depredations of the *curculio*, and its enormous fertility, gives it very properly a place in this class. It is a beautiful, early fruit, ripening before most other plums, and this comprises one of its chief merits as a market fruit. In size it measures about an inch in diameter; is of a lively, red color, with a thin bloom.

These varieties of native plums, planted in conjunction with the Damson, form a list which the orchardist may accept with confidence. They are all hardy, vigorous, abundant bearers, and cover a season of ripening from the first of June to the last of September.

GRAPES.

The culture of the grape within the last ten years has attracted a great deal of attention throughout the United States. Many vineyards of large extent have been and are still being planted in various portions of the country, and are proving a great pecuniary success. The many new and excellent varieties of native origin should no longer leave any doubts in the mind of the cultivator as to the result of the investment. While some make this branch of horticulture a specialty, from pecuniary motives, every one owning a garden spot should devote a portion of it to a few of the best varieties. Of the many good sorts worthy of cultivation, we would particularly recommend the Concord and Delaware for common garden culture. These varieties have proved almost perfectly hardy in Michigan, particularly the Concord, which is very strong and vigorous in its habits of growth, very productive, and fruit nearly of the best quality. The Delaware, though not quite so hardy and strong grower as the former, is nevertheless very productive, quite early in its season of ripening, and the fruit of the very best quality, both for the dessert and wine.—*Ilgenfritz*.

The following paragraph upon the best soil for the grape, is from "Downing's Fruits and Fruit Trees of America:"

"The universal experience in all countries has established the fact that a warm and dry soil is the very best for the vine. Where vineyards are cultivated, a limestone soil, or one composed of decaying calcareous rocks, is by far the best; but where, as in most gardens, the vine is raised solely for its fruit, the soil should be highly enriched. The foreign grape will scarcely thrive well here on a heavy soil, though our native varieties grow and bear well on any strong land; but the essence of all that can be said in grape-culture respecting soil, is that it be dry and light, deep and rich. Frequent top-dressing of well rotted manures should be applied to vines in open borders, and this should every third or fourth year be alternated with a dressing of slacked lime."

A little attention at proper seasons to the culture of the vine will afford a family a good supply of fruit of good size and flavor. Grape vines are ornamental, and may be planted where shade is required on the sides of buildings, arbors, and trellises. They require a rich soil, with a dry subsoil.—*Chilson*.

The grapes recommended by the Society are as follows:

Market—Hartford Prolific, Eumelan, Delaware, Israella (on suitable soils), Concord, Iona, Ives' Seedling.

Family—Hartford Prolific, Delaware, Eumelan, Concord, Diana (for keeping), Agawam (for keeping).

Amateur—Adirondac, Creveling, Eumelan, Delaware, Israella, Iona, Croton (trial), Rebecca, Allen's Hybrid, Diana (for keeping), Wilder.

CLASS I.—BLACK GRAPES.

Adirondac—One of the best of the newer grapes; bunch large; berries large, tender, and sweet; quite as early as the Hartford Prolific. Vine similar in wood and foliage to Isabella, but less vigorous.

Alvey—Bunch medium size, compact; berries small or medium; no pulp; sprightly, vinous; promises to be one of the best for wine. Ripens with us about same time as Isabella.

Barry (Rogers' No. 43)—Bunch rather short; berries roundish, much like Black Hamburg; delicate, sweet, and tender. Ripens with Concord.

Black Hawk—Bunch medium to large; berry large, nearly round; flesh somewhat pulpy.

Cornucopia (Arnold's No. 2)—Bunch large, compact, shouldered; berry medium; flesh sweet, with an agreeable, sprightly flavor. Ripens with Concord.

Canada (Arnold's No. 16)—Bunch above medium, shouldered; berry above medium size; flesh free from pulp, juicy, with a distinct foreign flavor. Ripens with Concord.

Canby's August (York Madeira)—Bunch medium size, compact; berry medium size, sprightly, vinous; will be a good wine grape. Ripens before the Isabella. Vine hardy, moderately vigorous; foliage rather small. Origin, Pennsylvania.

Clinton—Bunches small and very compact; berries small; sprightly; keeps well; one of the most free, rapid growers and profuse bearers. Ripens earlier than the Isabella.

Concord—One of the best, well-tried, native grapes. It is of very large size, both of bunch and berry; quality good; color black, covered with a thick, bluish bloom; flesh moderately juicy, rather buttery, very sweet. It is perfectly hardy; vigorous in its habits of growth, very healthy, and very productive. Ripens two weeks earlier than the Isabella. We think there is no grape which has given so universal satisfaction as this, and it is constantly increasing in public favor as the variety becomes older. No family should be without it.

Creveling—A fine grape, nearly as large in bunch and berry as the Isabella; bunch rather loose. Ripening almost as early as the Hartford Prolific; very valuable.

Essex (Rogers' No. 41)—Bunch medium size, shouldered; flesh tender and sweet, with a highly aromatic flavor. Ripens early.

Eumelan—Bunch good size, compact, shouldered; berry medium; flesh tender, sweet, sprightly.

Herbert (Rogers' No. 44)—Bunch rather long and loose; berry medium, tender, sweet, and rich. Early and productive.

Hartford Prolific—A hardy, profuse-bearing, and tolerably good grape. Ripening very early, and valuable on this account.

Isabella—Bunches long, large, loose; berries large, oval, juicy, sweet, and musky. A vigorous grower, hardy, and immense bearer. One of the most popular of all our native grapes. Requires a good season to mature perfectly in all parts of Michigan.

Isabella—Raised by Dr. Grant. A grape of fair quality, ripening shortly after the Hartford Prolific; promises to be valuable for market.

Ives' Seedling—Regarded as a very promising wine grape in Ohio; hardy and productive; about same season as Isabella.

Merrinack (Rogers' No. 19)—Bunch medium to large; berry large, sweet and rich; ripens early.

Norton's Virginia—Bunches long, rather loose; berries small, no pulp, vinous; esteemed one of the best wine grapes in Missouri.

Othello (Arnold's No. 1)—Bunch large, shouldered, compact; berry large; flesh solid, juicy, sprightly; ripens with Delaware.

Roger's Hybrid, No. 2—"Bunch large; berries large; ripens with Isabella."
 " " No. 33 } { Would all make superb market grapes, if the
 " " No. 36 } { bunches were not so variable in size, owing to
 " " No. 39 } { the fruit not setting well.

Salem (Rogers' No. 53)—Bunch and berries large; dark red; flesh tender, nearly free from pulp, sweet, aromatic and well flavored. Vine healthy, vigorous and productive. Ripens soon after Delaware.

Sherman—Bunch small, rather compact; berry medium, similar in flavor to Clinton, and ripens about same time.

Telegraph (Christine)—Fair quality, and said to be as early as Hartford Prolific.

To Kalon—Bunch and berry large, tender, sweet, excellent; vigorous and productive; ripens before Isabella. One of the best of our native grapes.

Union Village (Ontario)—Both bunch and berry very large; a magnificent grape in appearance, and in quality nearly as good as Isabella; ripens a little earlier; vine very vigorous, with large, healthy foliage.

Wilder (Rogers' No. 4)—Bunch variable, sometimes large, often small; flesh tender, with a slight pulp. Ripens as early as Concord; a good keeper.

CLASS II.—RED GRAPES.

Agawam (Rogers' No. 15)—One of the best of the red ones; bunch variable in size; sometimes large and handsome; flesh tender and juicy.

Catawba—Well known as the great wine grape of Ohio, Kentucky, etc.; bunches large and loose; berries large, of a coppery-red color, becoming purplish when well ripened; two weeks later than the Isabella; requires the most favored soils and situations, good culture and warm seasons to mature perfectly in Michigan.

Delaware—This fruit has fully maintained its reputation as the finest of our native grapes. The vine is comparatively slender, but grows freely. Small vines, the second year after planting, have made two shoots each, 12 feet high, and well ripened to the top, with ordinary culture, on our grounds. It proves quite hardy in this climate, and ripens two or three weeks before the Isabella. Bunch small and compact; berries small, light red, with a violet bloom; beautiful. Sweet, sugary and vinous, with a musky aroma; equal to the finest foreign varieties. It justly claims the best place in every garden.

Diana—About the same size and color of the Catawba, of which it is supposed to be a seedling; a beautiful and delicious grape; ripens about the same time as the Isabella. Vine remarkably vigorous; rather a shy bearer while young.

Gaertner (Rogers' No. 14)—Bunch and berry medium to large; aromatic; ripens early.

Goethe (Rogers' No. 1)—Bunch and berry large; flesh tender, melting, sweet and delicious; very late.

Iona—Raised by Dr. Grant; has already been widely disseminated and tested. Is regarded as a very promising grape both for table and wine. One of the finest in quality.

Lindley (Roger's No. 9)—Bunch long and compact; flesh sweet; ripens soon after Delaware.

Massasoit (Rogers' No. 3)—Bunch medium, shouldered; berry medium; flesh tender and sweet; early as Hartford Prolific.

Mottled—Medium-sized bunch and berry; a seedling of Catawba from Kelly's Island; ripens early.

Perkins—A large, handsome grape; ripens early; sweet, pulpy, foxy; very hardy, vigorous, healthy and productive. Origin, Massachusetts.

Requa (Rogers' No. 28)—Bunch large, shouldered; berry medium; skin thin; flesh tender and sweet.

Rogers' Hybrid No. 5—"Bunch medium ; berries large, dark red ; one of the earliest."

" " No. 7—"About the color of Catawba ; does not set the fruit as well as the others."

" " No. 8—"Bunch large ; berries large ; color amber red ; late."

" " No. 30—"Bunch large ; berries large, light amber ; ripens with Diana."

" " No. 42—"Large berry ; late ; may be classed as amber color."

Venango (Miner's Seedling)—A large, handsome grape ; sweet, but foxy ; very vigorous, productive and early.

Walter—Bunch medium, shouldered, moderately compact ; berry medium, round ; flesh juicy, sweet. Ripens with Concord.

CLASS III.—WHITE GRAPES.

Allen's Hybrid—A delicious grape of Chasselas character ; very much subject to mildew.

Autuchon (Arnold's No. 5)—Bunch long, moderately compact, often shouldered ; berry medium ; flesh sprightly, rich. Ripens with Delaware.

Croton (Underhill)—Said to be a cross between the Delaware and Chasselas de Fontainbleau. Bunch large, berry small ; quality excellent. Ripens between Hartford Prolific and Concord.

Lydia—A seedling of Catawba ; earlier, of good quality ; one of the best of our white grapes.

Maxatawney—From Pennsylvania ; of good quality ; ripens about same time as Isabella ; resembles Rebecca.

Rebecca—A fine and delicious grape ; berry and bunch medium size ; vine a free, slender grower and abundant bearer ; quite hardy ; ripens almost as soon as the Delaware. We regard it as the highest-flavored of our native grapes ; recommended particularly for careful garden culture.—*Barry*.

SELECT FOREIGN GRAPES.—GROWN IN VINERIES.

CLASS I.—BLACK OR PURPLE GRAPES.

Black Prince—Large, oval ; bunches long, rather open ; sweet and fine. A profuse bearer.

Black Frontignan—Berries medium size, round ; bunches long ; flavor rich and musky ; prolific.

Black Hamburg—A fine grape, and a general favorite for the vinery ; bunches are large, very much shouldered—that is, branched ; berries large, sweet and rich.

Black St. Peters—Bunches large ; berries large ; late ; hangs well after being ripe ; valuable.

Black Muscat of Alexandria—(See Muscat Hamburg).

Duc de Magenta—A large grape ; flesh juicy and very rich ; vigorous ; ripens three weeks before the Black Hamburg.

Early Black Bordeaux—Berries round, above medium size ; bunches short ; flesh melting and very rich ; one of the finest early purple grapes known.

Jura Muscat—Bunches long and tapering ; berries above medium size, oval, and well set ; flesh richly flavored with a fine muscat aroma.

Lady Downs—Berries large, oval ; flesh firm, sweet and richly flavored with a fine aroma ; one of the best late grapes.

Madresfield Court—Berries very large ; rich muscat flavor. A superb grape.

Mill Hill Hamburg—Berries round, very large; bunches large; one of the best late sorts.

Muscat Hamburg—An English variety of great reputation; equal to the Black Hamburg in size and beauty, with the musky flavor of the Muscat of Alexandria.

Muscat Lierval—Berries round, medium size; deep purple; flesh rich and sugary, with a slight muscat flavor; a new and very early sort.

Muscat D'Aout—Berries medium sized, round, inclining to oval; skin deep purple; flesh very rich and juicy, with a slight muscat flavor. An early grape well adapted to pot culture.

Purple Sweetwater (Black Sweetwater)—Bunches small, short and compact; berries round; flesh tender, juicy, and very sweet.

Trentham Black—Bunches large, tapering and shouldered; berries oval, large; flesh abundantly juicy, very rich, sugary and vinous. A great bearer and a good grape.

CLASS II.—RED GRAPES.

Grizzly Frontignan—Bunches large; berries large and beautiful, early, and have a rich, musky flavor; fine.

Lombardy (Flame-Colored Tokay)—Bunches very large; shouldered, closely set and handsome; berries large and round, inclining to oval; flesh firm, sweet and well flavored.

Rose Chasselas—A beautiful large grape; a sure and abundant bearer; excellent.

CLASS III.—WHITE GRAPES.

Bowood Muscat—A superb grape, which supersedes the *Muscat of Alexandria* and *Canon Hall*, being quite as large as either; sets well, and ripens well in cold vineries. Bunches very large and well shouldered; berry large, of a bright amber color at maturity, with a sugary, muscat flavor.

Buckland's Sweetwater—A splendid grape; hardy and prolific.

Chasselas Musque (Muscat Blanc Hatif)—Bunches long, loose; berries medium size, with a fine musky flavor; excellent; cracks occasionally.

Chasselas Duhamel—Berries round, large, pale amber, rich, juicy and good.

Chasselas Vibert—Berries round, very large; flesh juicy, rich and agreeable; a robust grower and an excellent grape.

Chasselas Royal—Berries round, large; bunches short and thick; shouldered; a great bearer; a new and excellent grape.

Golden Chasselas—A large, handsome grape; hardy, productive and excellent; resembles *Royal Muscadine*.

Golden Hamburg—A magnificent grape from the *Sweetwater* and *Black Hamburg*.

Golden Champion (new)—Bunches large; berries very large; flesh firm and very juicy. A superb grape.

Primavis Frontignan—Bunches very large; berries round, large, rich, juicy and excellent; the finest of the *Chasselas Musque* race.

Royal Muscadine, or *Chasselas de Fontainbleau*—One of the finest varieties; bunches sometimes weighing five or six pounds.

White Frontignan (Muscat Blanc of the French)—One of the oldest varieties; bunches pretty large; berries roundish, rich and quite musky.

White Muscat of Alexandria—This is a most delicious variety, considered

the same as the imported "Malaga;" bunches large, branched and loose; berries large, fine and rich, with a high musky flavor; sets badly in cold vine-ries usually.

White Sweetwater—Bunches of good size; open; berries of medium size, round, sweet and watery; occasionally produced in tolerable perfection in the open air; early.

SMALL FRUITS.

The small fruits recommended by the Society are as follows:

STRAWBERRIES.

Market—Wilson's Albany.

Family—Wilson's Albany, Charles Downing, Green Prolific, Michigan, Downer's Prolific.

Amateur—Downer's Prolific, Michigan, Charles Downing, Agriculturist, Lennig's White, Green Prolific, Kentucky (late), Triomphe de Gand.

RASPBERRIES (RED).

Market—Philadelphia, Clark (on lake shore).

Family—Philadelphia, Purple Cane.

Amateur—Brinkle's Orange (tender), Philadelphia, Clark.

RASPBERRIES (BLACK CAP).

Market—Doolittle, Mammoth Cluster.

Family—Davison's Thornless, Doolittle, Mammoth Cluster.

Amateur—Miami (old), Davison's Thornless, Doolittle, Mammoth Cluster.

BLACKBERRIES.

Market—Lawton (where hardy), Kittatinny.

Family—Wilson's Early, Kittatinny.

Amateur—Wilson's Early, Kittatinny, Lawton.

CURRANTS.

Market—Cherry, Red Dutch, Victoria.

Family—Cherry, Red Dutch, White Dutch, White Grape, Victoria.

Amateur—Red Dutch, White Dutch, White Grape, Victoria, Black Naples.

GOOSEBERRIES.

Market—Houghton, Mountain Seedling.

Family—Houghton, Downing.

Amateur—Houghton, Downing.

BLACKBERRIES.

Crystal White—Fruit medium; light creamy white; translucent, sweet, good. Only valuable as a curiosity.

Kittatinny—Fruit large to very large; rich glossy black; moderately firm, juicy, sweet, and excellent. It has within a few years become widely disseminated, and everywhere proves of the highest value. Canes quite hardy and very productive. Ripening early and continuing a long time. The most profitable market sort.

Lawton (New Rochelle)—Fruit very large; intensely black when fully ripe. When mature the fruit is very juicy, rather soft and tender, with a sweet, ex-

cellent flavor. It is of a very vigorous growth, hardy, and exceedingly productive. Ripens about the first of August, and continues in bearing a long time.

Sabie Queen—A new variety, lately introduced from Massachusetts, whence it comes described as in size, beauty, and fruitfulness equal if not superior to the New Rochelle.

Wilson's Early—Fruit large, black; flesh firm, sweet, good. Valuable because of its earliness in ripening.

RASPBERRIES.

To keep a raspberry bed in good, productive condition, the old, weak, and dead wood should be cut out every season, as soon as the crop is gathered, to give strength to the young shoots for the next year's bearing. In spring, the weakest suckers should be removed, leaving five or six of the strongest in each hill. The ground should be spaded, and a top dressing of manure given.

Protection—To guard against injury by the winter, the canes may be tied to stakes and covered with straw, or they may be laid down in the autumn and covered with a few inches of earth, leaves, litter, or branches of evergreens.—*Barry*.

Antwerp Red (of the Hudson river)—This is an excellent variety, and very popular in market. Three-quarters of an acre of land on the Hudson, planted with it, yielded \$330; and three acres in the same locality, \$1,500 in one season. The berry is large, conical, dark red, rich, and juicy. Very early. Canes have a few small purple spines.

Antwerp Yellow, or White—Fruit large, pale yellow, sweet, and rich; a beautiful and excellent fruit, but not so well adapted to marketing as the preceding; tender. Canes thickly covered with greenish spines.

Antwerp Red—This is the genuine Red Antwerp, quite distinct from the Hudson river variety; finer flavored, but not so firm, nor so valuable for market.

Catawissa—Fruit medium; dark crimson, covered with a thick bloom. Well suited for amateur culture. In order to obtain the best crops, the canes should all be cut away in the spring, and as the new sprouts grow they should be thinned to four to six canes only. Ripens first of August, and continues a long time.

Clarke—Fruit large; bright crimson; flesh rather soft; juicy, sweet, and excellent. Foliage large, flat, and thick, and endures heat and cold better than any European variety we have. Valuable as a family fruit.

Davison's Thornless—This variety differs from the American Black Cap only by its ripening a few days earlier. It is about as vigorous, not quite as large, but a little sweeter, and the canes without thorns, except a small one on the leaf stalk.

Cincinnati Red—A vigorous, upright grower; productive; fruit medium; light crimson, with a slight bloom; flesh tender, with an excellent flavor.

Doolittle (Improved Black Cap)—The fruit of this variety is an improvement on the American Black Cap. One of the best of its class as a market fruit.

Golden Thornless—A large variety of the American White or Yellow. Moderately vigorous and productive, and has but few spines.

Herstine—Plant a good grower; most abundant and early bearer; suckers moderately; fruit large, oblong, with small grains and crimson color; flavor

subacid and very good. This new seedling promises to supersede all other red varieties now under cultivation, as it confirms all the requisites heretofore wanting, viz., beauty, great productiveness, very large size, bright scarlet color, and superior flavor.—*Wm. Parry's Circular*.

Lum's Everbearing—This variety is very much like the Ohio Everbearing Black Cap. Like the Catawissa, it is advisable, when a full autumn crop is desired, to cut away the canes in spring.

Mammoth Cluster (McCormick)—A variety of the American Black Cap, with stronger and more vigorous canes, having fewer spines, and more productive, and is the largest and best Black Cap yet produced. Fruit similar in form to American Black Cap, but of much larger size, of deeper color, more bloom, juice, and sweetness.

Ohio Everbearing—It is precisely like the American Black Cap in all respects except that it has the valuable property of bearing abundant crops of fine fruit till late in the season.

Orange (Brinckle's Orange)—This is unquestionably the largest and finest light-colored raspberry yet known, and deserves a place in every garden; fruit large; color, beautiful orange; excellent.

Philadelphia—Fruit medium; dark crimson or purplish red; flesh moderately soft, mild, subacid, good. The canes are hardy, vigorous, and very productive. The most profitable red market sort.

Purple Cane—Medium size; purplish maroon, slight bloom; flesh soft, juicy, and rich. A native sort.

Seneca Black Cap—A variety of the Black Cap. It is larger and later than Doolittle; very vigorous, very productive; fruit rather larger than Doolittle; not as black, but with a shade of purple; light bloom; juicy and sweet.

STRAWBERRIES.

No garden should be destitute of this delicious fruit. They are easily grown and productive. One rod square, well treated, should yield at least two bushels. The ground should be deeply spaded and well manured. Put out the plants in rows two feet apart, in hills twelve or fifteen inches distant. They can be planted at almost any season of the year. Of course, if planted in warm, dry weather, they must be watered and shaded. The runners should be kept cut off, which can be easily done with a sharp spade. In the winter, leaves, coarse manure or litter should be placed around and over them.

Time to Mulch Strawberries.—Whatever may be said of the best time to mulch strawberries to protect them during the winter's cold and the spring frosts, my experience rests in putting on the mulch just after the ground has become frozen,—say one to two inches deep; cover the line between the crowns of the vines four inches deep, and over the crowns put only one inch. Straw, leaves, bog hay, or coarse grass litter, is all that is requisite.—*Cor. Country Gentleman*.

Agriculturist—Fruit large; deep crimson; flesh dark red, quite firm, juicy, sweet and rich. Hardy and productive. Pistillate.

Boyd's No. 30—Very large; bright crimson; flesh quite firm, juicy, rich subacid. Plant vigorous and very productive.

Burr's New Pine—Medium; light crimson; flesh tender, juicy, with a sweet, rich, aromatic flavor. Vines moderately vigorous; productive. One of the most desirable for the amateur. Flowers pistillate.

Charles Downing—Fruit very large; deep scarlet; flesh quite firm, pink,

juicy, sweet, rich. Plant very vigorous and productive. This is one of the most desirable varieties in cultivation. Flowers perfect.

Downer's Prolific—Fruit medium to large; light, clear, bright scarlet; flesh rather soft, juicy, rich, but a little acid. Plant vigorous and very productive. Valuable for near market growing. Flowers perfect.

Fillmore—Fruit medium to large; rich, deep scarlet; flesh moderately firm, rich acid. Plants moderately vigorous. Valuable for amateur culture under high cultivation. Flowers pistillate.

Green Prolific—Fruit orange scarlet; surface soft; centre of flesh firm, rather acid. Plant hardy, very vigorous, very productive, and highly valued by some as a market berry. Flowers pistillate.

Jucunda (Knox's 700)—Fruit large to very large; bright light scarlet; flesh light pink, moderately firm, sweet, not high flavor. This variety does extremely well in some localities under high cultivation.

Kentucky—Fruit large to very large; bright scarlet; flesh white, firm, juicy rich, sweet and of excellent quality. Plant strong, vigorous, very productive, with long fruit stocks bearing the berries well up from the ground, and the foliage standing the heat of summer and cold of winter, and is a week later than most varieties. Flowers perfect.

Lennig's White—Fruit large; color whitish, tinged with red; flesh soft, tender, juicy, sweet, rich, delicious pine-apple flavor. Plants vigorous, moderately productive. One of the finest-flavored varieties in cultivation; well suited to amateurs. Flowers perfect.

La Constant—A magnificent foreign sort, which, under good management and high culture, is seldom surpassed. Very large, regular, conical; bright crimson; fine flavor; flesh quite firm. Plant rather a dwarf grower, but quite productive. Staminate.—*Ilgenfritz*.

Michigan—Is a seedling, originating with B. Hathaway of Little Prairie Ronde, Cass county Michigan, who sent it out on or about the year 1868. During this year some account of several seedlings of his, designated by numbers, was contributed by him to the Western Rural. Of these, No. 1 is understood to designate the variety subsequently named Michigan. Of this he says: "For field cultivation it will take the lead; the berry is light scarlet in color; about the size of the Wilson, with fewer small ones; hang on the vine well; and as to fruitfulness it is a marvel to behold. One hill, in no way remarkable from the other, produced one and one-third quarts, or at the rate of four quarts to three hills."—*T. T. Lyon*.

Nicanor—Having fruited this variety for eight years, and the last four years grown it extensively for market, we feel no hesitation in recommending it as the most hardy, vigorous, and productive that has yet been introduced. Fruit of uniform, moderately large size, roundish, conical; bright scarlet; quality good. It begins to ripen with the earliest, and continues a long time.—*Ellwanger & Barry*.

President Wilder—Fruit large to very large; bright crimson scarlet; flesh rosy white, quite firm, juicy, sweet, and rich.

Russell's Prolific—Fruit large; scarlet, changing to crimson; flesh rather soft, mild, moderately rich, pleasant. Vines vigorous and productive. Pistillate.

Triomphe de Gand—A Belgian variety, which appears to stand our climate and produce more crops than any other foreign sort. The vines are vigorous and healthy, hardy, moderately productive, and well suited to strong, clayey

soils. Requires high cultivation and to be grown in hills. Fruit large; bright, rich red near the calyx, almost greenish white at the point; glossy as if varnished; flesh firm, white, juicy, with a peculiar rich and agreeable flavor. Flowers perfect.

Wilson's Albany—Although not of high quality, yet no variety has become so generally cultivated as the *Wilson's Albany*. The vine is hardy, vigorous, and productive, commencing to ripen its fruit early and continuing to the latest. The most profitable market berry for general cultivation.

APRICOTS.

The Apricot is one of the most delicious of our dessert fruits. It ripens between cherries and plums. The remarks on the *curculio* under the head of plums are applicable to the Apricot. The tree may be trained on walls, but a northern or western exposure is best. It is recommended to shorten in the limbs of the Apricot as was remarked also of the peach.

Breda—Small, skin pale red in the shade, reddish-purple in the sun; flesh orange color, juicy, rich, with a pleasant flavor; kernel sweet. Last of July and first of August.

Early Golden (Dubois' Early Golden)—Fruit small, roundish oval; pale orange color; flesh yellow, moderately rich and sweet. Tree vigorous, with long slender branches. Middle of July.

Large Early—Large, orange, with a red cheek; flesh sweet, rich and excellent; parts from the stone. Tree vigorous and productive. Beginning of August.

Moorpark—One of the largest and finest Apricots; yellow, with a red cheek; flesh orange, sweet, juicy and rich; parts from the stone. Very productive.

Purple, or Black Apricot—This is quite distinct in all respects from others, very much like a plum; small, pale red, purple in the sun; flesh yellow, juicy and pleasant. The tree has slender, dark shoots, and small, oval, glossy foliage. It is as hardy as a plum, and therefore worthy of attention where the finest sorts are too tender. August.

NECTARINES.

The Nectarine requires the same culture and management as the peach, from which it differs only in having a smooth skin, like the plum. It is extremely liable to attacks from the *curculio*, and needs the same remedy as recommended for the plum.

Boston—Fruit large and handsome. September.

Elruge—Medium size, greenish-yellow, with a dark red cheek; flesh greenish-white, juicy and high flavored; excellent. Beginning of September.

Red Roman—Greenish-yellow and red, rich and good. September.

Hunt's Tawney—Medium size; pale orange, with mottled red cheek; flesh juicy, melting, rich and good.

QUINCES.

Apple or Orange—Large, roundish, with a short neck; of a bright golden yellow color. Tree has rather slender shoots and oval leaves; very productive. This is the variety most extensively cultivated for the fruit. Ripe in October.

Angers—A strong, rapid-growing sort; has large fruit, of fine quality.

Red's Mammoth—A very large variety of the Orange Quince. A strong grower, and productive.

MULBERRIES.

Black English—Fruit large and fine ; delicious flavor. Slow grower.

Downing's Everbearing—Fruit large ; rich, juicy ; high, vinous flavor. Tree very vigorous and productive.

White—Fruit small ; sweet and good.

MISCELLANEOUS FRUITS.

Berberry, Common Red—Fruit small ; crimson ; is too acid to eat, but it makes an agreeable preserve and jelly, and an ornamental pickle for garnishing some dishes.

Berberry, Purple—Fruit similar to above, except that the fruit and leaves are purple.

Chestnut, American—One of our handsomest and most valuable timber trees ; magnificent in foliage and bloom, and prodigal in the supply of nuts, which find their way into the pockets of every schoolboy in the land.

Chestnut, Spanish—An European variety. The nuts are of larger size than the American variety, but not as sweet.

Juneberry, Dwarf (Service Berry)—This variety of the Juneberry attains the height of from six to eight feet. Bush is hardy and extremely productive. The color of the fruit is a bright crimson, overspread with purple. The fruit is prized in culinary preparations and for the dessert. One of the most beautiful fruits in cultivation.

MONEY IN ORCHARDS.

AN ESSAY READ BEFORE THE STATE POMOLOGICAL SOCIETY IN REPRESENTATIVE HALL AT LANSING, FEBRUARY 11th, 1875, BY
HON. EMMONS BUELL OF KALAMAZOO.

GENTLEMEN:—It is with no small degree of diffidence that I appear before this society to read an article on fruit, before members many of whom have spent almost a lifetime in the production and marketing of fruit. But in recording my thoughts I shall be excused if I fail to enlighten you of more extended experience and observation.

Perhaps it will not be out of place or unacceptable if I first state

HOW TO GET AN ORCHARD.

In the fall go to the nearest reliable nursery and *select* good, thrifty two or three-year-old Northern Spy trees. Carefully take them up, securing plenty of roots without bruising. Take them home and heel them in, in a protected situation. In the spring set them out with great care, and mulch them. As this is to be a market orchard, but few varieties will be desirable. Now proceed to top-graft almost or all of them to Red Canada. Parties will add other varieties, as they may wish to have a little personal experience of their own, rather than learn wisdom by observing the experience of others.

THE RED CANADA,

perhaps, in tree and fruit combined, comes more nearly in making up all the requisite qualities desired in a winter apple for market of any on the list.

The tree is hardy, a fair grower, and in style of top all one can wish. In fruit it is a good bearer, a good handler, and keeps well; in quality unexceptionable, whilst its bright red color makes it very attractive, as the high price it brings in market fully attests.

But if you must add the Baldwin, Wagener and King, etc., do not fail to put them on Spy stocks. Give the ground good cultivation the fore part of the season, and wash the trees with soft soap about the first of June for a number of years.

GATHERING THE FRUIT.

The apples should be picked in baskets with great care, to avoid bruising, and turned on a table made for the purpose of assorting them. This table should be of about the following dimensions: Two inches higher than a barrel, six feet long and three wide, with a strip two inches wide nailed on around the

table, to prevent the apples rolling off; spread an old blanket, or quilt is better, on the table to prevent bruising.

ASSORTING AND PACKING.

In assorting the apples from this table, make two grades—one of perfect apples, the other of the poorer quality. The worthless for market throw one side for cider. First, place two courses of apples in the bottom of the barrel, with the stems down; then proceed to put the apples in, not dropping them, but reach the hand down so they will not bruise in the least. Shake the barrel gently two or three times whilst filling. Too little attention is paid to this matter of assorting. Take three barrels as they are ordinarily put up, and make two barrels of good quality and one of inferior. The two extra barrels will sell for more money in market than the three unassorted. The perfect apples will keep much longer, thus favoring the chances for better prices. Then it is with no small degree of pleasurable satisfaction to know you have as good apples as any of your neighbors, when they call for an evening social chat and you bring out your beauties to their wondering gaze!

THE ORCHARD GROUND

devoted to some hard crop may be made to pay for care and cultivation of the orchard till it is in good bearing condition.

AMOUNT OF FRUIT PER ACRE.

An orchard will contain about fifty trees to the acre. I think they may safely be estimated to produce one barrel per tree for a great number of years, or whilst in good condition. This would give fifty barrels per acre each year, and at two dollars per barrel would be one hundred dollars per acre. I think a good orchard, with care, and composed of the best varieties, will exceed rather than fall short of these estimates.

The above estimates are made from the amount of apples produced by young trees for the past five years, composed of Red Canada, Wagener, and Maiden's Blush.

Three-fourths of the orchards put out twenty years ago throughout the country are composed of varieties to a great extent almost *worthless*. Persons owning such orchards cannot see any profit in fruit,—like the man who has an orchard of one hundred trees, twelve of these being of choice varieties are of more value than the other eighty-eight.

MARKETING.

Much might be said under this head. Perhaps one-half of the apples throughout the State are gathered and turned into a wagon box and taken from three to ten miles, over rough roads, to market. You can imagine their condition,—I cannot describe them. Here the purchaser culls out perhaps one-third and puts one side as worthless, paying you probably fifty cents per bushel for those he deems fit to ship. The refuse apples, having taken them to market, you do not feel inclined to be seen taking them home again, so you leave them with this fair, conscientious dealer, who, as the shades of night gather around, he also gathers up these cast-off piles of apples and quickly deposits them in barrels, and the next morning they are on the way to some large boarding-house, hotel, or Alden dry-house in Chicago, while you, by a few sharp applications of pure Saxon from your better-half, have waked to the

consciousness of having been cheated. This may be called glutting the market with a vengeance. A better way would be, if your fruit has been put up as here described, to send it to some reliable commission man,—as some such may still be found,—to be held for sale as the condition of the fruit and market would best warrant a fair price; or better still, perhaps, be put into a cool, dry cellar and held for a home market.

Apples that at the time of gathering last fall would bring only a dollar and a half or two dollars at best, have been sold within the past month for from three to five dollars per barrel.

There is a profit in raising fruit for market; therefore, you who have a taste for it, plant trees, especially apple trees, and do not forget the pear and peach, and also the grape and smaller fruits.

THE DESTINY OF NORTHERN MICHIGAN.

BY HON. WM. L. WEBBER OF EAST SAGINAW, AND READ AT THE LANSING MEETING, FEBRUARY, 1875.

GENTLEMEN :—As Patrick Henry observed in one of the discussions preceding the Revolution, now an hundred years since, "I know no way of judging the future but by the past." Allow me, therefore, to call your attention to some facts of the past and some of the present, and from a consideration of these facts we shall have no difficulty in judging of the probable future.

The State of Michigan embraces an area, as reported by the Commissioner of the General Land Office of the United States, of 36,128,640 acres, of which approximately ten and a half million acres are contained in the Upper Peninsula leaving about twenty-five and a half million acres for the Lower Peninsula.

Although the Upper Peninsula, an empire by itself, might properly be called Northern Michigan, yet the expression, as ordinarily used, is confined to the Lower Peninsula, and has heretofore been applied to that portion of the Lower Peninsula which is in fact the central portion thereof.

WHAT AND WHERE IS "NORTHERN MICHIGAN?"

In 1837 the Legislature passed "An act providing for the construction of certain works of internal improvement, and for other purposes," by which it was provided that surveys should be made for three railroad routes across the Lower Peninsula of Michigan, the first to commence at Detroit, and to terminate at the mouth of the St. Joseph river on Lake Michigan, to be called the Central railroad; the second to commence at the navigable waters of the River Raisin, and, passing through Monroe, to terminate at New Buffalo, to be called the Southern Railroad; the third to commence at the mouth of Black River, now Port Huron, and to terminate at the navigable waters of Grand River, in Kent county, or on Lake Michigan, now Grand Haven, and to be called the Northern Railroad. At that time the line of the Northern Railroad, as above designated, extended through what was known as Northern Michigan. As a matter of fact, however, about three-fifths of the area of the Lower Peninsula lies north of that line. If the Lower Peninsula be divided by a line equidistant between the southern boundary of the State and the Straits of Mackinaw, being a line on the north side of town 15 north, extending through the northern part of the counties of Midland, Isabella, Mecosta, Newaygo and Oceana, it will be seen that in the Lower Peninsula lying north of that line

there are about ten and a half millions of acres, and about fifteen and a half millions of acres south of the line, and by this division the Northern Railroad line above mentioned was about fifty miles south of the center of the Lower Peninsula.

Dividing the Lower Peninsula into equal areas and the dividing line extends along the northern line of township 11 north from Port Sanilac, on Lake Huron, near Saginaw, St. Louis, Howard City and Newaygo to the mouth of White River, on Lake Michigan, about twenty-five miles north of the line of the Northern Railroad, and having approximately thirteen millions of acres north and the same quantity south of it, so that in fact the central portion of the Lower Peninsula is north of what has heretofore been regarded as Northern Michigan, and the larger portion of those northern counties, as heretofore called, of Saginaw, Gratiot, Montcalm and Muskegon, are in fact in the southern half of the Lower Peninsula. In speaking of what is ordinarily called Northern Michigan I shall be in fact speaking of Central Michigan.

THE SURFACE AND ELEVATION.

The general surface of the country through this portion of the State has an altitude above the sea greater than the more southerly portions of the State. Those who judge of the country from some of the earlier maps published, which, assuming to represent swamp lands by a heavy shade, were found covered with large black patches extending over a large portion of the surface, form an erroneous notion on this point. Lakes Michigan and Huron are substantially identical in their elevation above the sea. As compared with the surface of Lake Michigan, Kalamazoo has 138 feet elevation; Morley, 300 feet; Big Rapids, 340 feet; Reed City, 455 feet; Olam Lake, 690 feet; the eastern part of Lake County, about 600 feet, and the western part about 150 feet; Clare County, from 400 to 500 feet, and Osceola County about the same, while there are points on the Grand Rapids & Indiana railroad, and also on the Jackson, Lansing & Saginaw railroad, which reach an elevation of over 800 feet above the level of the lakes.

THE WATER.

This portion of the State is abundantly supplied with numerous springs of pure, cold water, which form the sources from which arise the many streams which flow through this section.

THE SOIL.

The soil is greatly diversified, some portions being rich alluvial with clay subsoil, others loam, gravel, and clay intermixed, and for agricultural purposes is unsurpassed by any other portion of the State.

THE TIMBER.

The timber is of all qualities,—pine, hemlock, oak, beech, maple, basswood, rock elm, black cherry, white-wood, black ash, etc., etc.

THE PINE LANDS.

An erroneous idea is entertained by many concerning the character of the soil on which the pine is found. In most cases the pine grows intermixed with hard wood, or in clumps surrounded by beech and maple, sometimes found in belts interspersed with other timber; but even where pine is almost the only timber upon the ground, it has been found that the soil is capable of

producing excellent returns to the agriculturist. It is true the pine stumps are an incumbrance and somewhat difficult of removal, but time and labor will remove them; and as the soil is capable of producing good crops, the time will come when as good returns will be had from land once covered with heavy pine as from the average lands covered with hard wood.

MEANS OF ACCESS.

Surprise is often expressed that so desirable a portion of the country should not have been settled earlier; that the tide of emigration which has been flowing through the States so many years had not been turned into this undeveloped portion of it. But it is known that the means of access to this portion of the State were very uninviting, and besides, when the rich prairie lands of the West offered to the settler farms already improved, ready for occupancy, it is not surprising that they should be preferred to heavily timbered lands which required the labor of a generation to bring them to the point where they could be cultivated as cheaply and as easily as the prairie farms at first. In fact, had it not been for the wealth of timber, it is probable that this portion of the State would have lain a wilderness for many years yet.

THE REAL PIONEER.

The lumberman was the pioneer roadmaker and the pioneer agriculturist of this portion of the State. In order to reach his lumber camps it was necessary that roads should be made. But these camps being at so great a distance from a supply, the cost of transportation was such as to make it desirable that such articles as were needed in camp should be raised where they were wanted, and the result was that the lumbermen turned their attention to farming for the purpose of supplying their own wants, and their experiments demonstrated the capability of the soil. But with them agriculture was only resorted to as a means to enable them with greater economy to carry on their lumbering operations, and consequently they limited their supply to the demand. In fact, had a surplus been raised, there were no modes of transportation by which it could have been profitably taken to market. But while the agriculture of the country was inaugurated and the capability of the soil demonstrated by the lumberman, yet, as the expense of transporting the surplus was prohibitory, no effort was made to raise more than was wanted to supply the home demands. Now, however, as the country is opened up by railroads, so that better facilities both for ingress and egress are afforded, many have availed themselves of the opportunity to secure permanent homes, with the intention of devoting their entire time to agriculture and kindred pursuits.

HEALTH.

Many have supposed this portion of the State to be unhealthy; that fevers and agues were the common lot of its inhabitants. This idea, however, has no foundation in fact. While it is true that the inhabitants are not entirely exempt from sickness, yet a personal observation of over twenty years justifies me in saying that there is far less sickness than attended the settlement of the more southerly portions of the State—less by far than attended the settlement of Western New York or Northern Ohio. I do not think a healthier region is to be found than upon the elevated lands of this central portion of the State. Its pure water and clear and bracing air will demonstrate to any one visiting the country that the stories told of disease and death in this region must have originated in connection with that notion of an earlier day that Michigan was

one grand swamp. You remember the report made by the Surveyor-General of Ohio, in 1815, quoted by Hon. William A. Howard in his oration on the occasion of laying the corner-stone of the new capitol, in which it is said, among other things, that the country was very low and swampy, with intermediate spaces of poor, barren, sandy land, on which scarcely any vegetation grows, except very small scrubby oaks, and that taking the country altogether, so far as explored, and to all appearances, together with information received concerning the balance, it was so bad that not more than one acre out of 100, if there would be one out of 1,000, would in any case admit of cultivation.

With our present knowledge of the country we can afford to laugh at this report; but the same information, or want of it, which would justify the Surveyor-General in making such a report and placing it on file as official would lead the people generally to believe that Michigan was substantially uninhabitable; and such beliefs once popular yield only to absolute demonstration of their falsity. When proved to be false in part it did not seem to be considered as evidence that they were false altogether.

AN EARLY AND MORE RELIABLE REPORT.

There were those, however, who seemed to be better informed concerning Michigan, even in that early day. In a work on geography by Jedediah Morse, D. D., thirteenth edition, published in 1813, the Territory of Michigan is thus mentioned: "In 1796 the port of Detroit was ceded by the English to the United States, and this fine peninsula was formed into a county called the County of Wayne. In 1805 it received the name of the Michigan Territory, was formed into a district government and a governor appointed over it. The country is improving, and when the lands are put on sale it is thought the population will rapidly increase. The greater part of the inhabitants of this country are Catholics. The Protestants have no settled minister. * * * According to the census of 1810 the population was 4,762. * * * The climate is cold and healthy. Winter sets in about the middle of November, and lasts till the middle of March without much variation. The general face of the country is flat. Nothing like a mountain is known. It is estimated that upwards of 20,000,000 acres of this Territory is excellent. The agricultural products of 1810 were 20,000 bushels of apples; 10,000 bushels of maize; 12,000 bushels of wheat; 8,000 bushels of oats; 100 bushels of barley; 1,308 bushels of buckwheat; 12,540 bushels of potatoes; 3,024 bushels of turnips; 1,000 bushels of peas, and 1,500 barrels of cider."

Let the curious compare this agricultural production of 1810 with the census tables of the present. Of course, we have no means of knowing from whence the reverend doctor obtained his information concerning the face of the country, but certainly it was much more reliable than that furnished by the official report above alluded to.

The writers of those days spoke from what information they had before them, but they had no *knowledge* on the subject. They spoke of it as the early geographers mentioned the "Great American Desert,"—from report. Now, however, we can speak from actual knowledge, and it is well known that the Lower Peninsula of Michigan furnishes as great an area of tillable land valuable for agricultural purposes in proportion to the number of acres within its boundaries as can be found anywhere within the United States in like limits.

THE PROGRESS.

The progress which has been made in development as between the northern half of the Lower Peninsula, computing by areas, and the southern half, will appear in the following figures. The southern half shows of improved land as shown by the different censuses:

	Acres.
1854.....	2,097,958
1864.....	3,583,411
1870.....	4,845,166
1874.....	5,163,473

The northern half shows of improved lands:

	Acres.
1854.....	10,350
1864.....	84,095
1870.....	234,134
1874.....	338,959

THE POPULATION.

The population of the southern half, as shown by the census of 1864, was 726,021; in 1874, 1,066,399. The population of the northern half in 1864 was 49,497; in 1874, 204,648. The per cent of increase in the southern half in ten years is about 47; and in the northern half, 313. Northern Michigan is attractive, as is shown by the fact that several of the counties in the southern half of the State show a decrease since the last census.

ORCHARDS.

Referring to the specialty of this Society, the census of 1874 shows devoted to orchards in the northern half 13,123 acres, and it seems to be demonstrated that that portion of the northern half of the peninsula which lies along Lake Michigan is capable of increasing its fruit production to an almost indefinite extent, while apples, pears, plums, and small fruits thrive in nearly all sections.

THE FUTURE LUMBER INTEREST.

In considering the future of the agricultural interests of the northern half of this peninsula, the fact that a large portion of it is covered with valuable timber is not to be lost sight of. Of pine alone there is probably sufficient to make fifty thousand million feet of lumber. The wealth of the State will be promoted by handling this immense quantity only so fast as the timber may be required at remunerative rates, and erecting and operating such manufacturing as will fit it for the consumer's use before transportation, so that Michigan may receive the full benefit of its native wealth. And that policy which should cut this timber and force it upon the market faster than demanded, or which should send it in a coarse and unfinished condition into other States for the finer manipulations, would be an unwise one. Properly treated, the lumbering interest and the agricultural interest should go hand in hand and support each other. A home market is always more valuable to the agriculturist than a foreign one, and the lumbering which goes on in the immediate vicinity will not only furnish a market for the surplus products of the farmer, but also employment for himself and his teams when their services may not be required upon the farm, and at remunerative prices. Growing, as the pine does, in belts and groups intermingled with hard timber, probably two-thirds of

the space may be reclaimed for agricultural purposes, without material injury to the pine timber.

THE DAIRY INTEREST.

Another interest which this country is capable of fostering and rendering of great value is that of the dairy, which has proved so successful in the Mohawk Valley in New York. Our latitude is about the same as theirs,—our winters are no more severe. Our soil is equally productive, large areas are natural grass lands, particularly in the Saginaw Valley, and I have no doubt the near future will witness the building up of large interests in this direction. Butter and cheese comprise so much value in small compass as to make the question of transportation comparatively an easy one, and with such a foreign demand as seems to be almost unlimited, no reason exists why this interest should not become a prominent one.

The census of 1870 shows a production of butter in the entire State for one year of 24,300,139 pounds, while of cheese there were but 644,914 pounds, there being but thirty cheese factories in the State. The future will change all this; while we shall not produce less butter we shall have more cheese. To show the progress cheese factories and cheese manufacturers have been making in the United States, let me state the fact that, for the year from July 1st to June 30th, 1859–60, there was exported from all ports in the United States to all foreign countries 15,515,799 pounds of cheese; for the year 1869–70, 57,296,323 pounds, and for the eleven months of the year 1873–74, 75,838,443 pounds. With a natural capacity unsurpassed in that regard, Michigan cannot long remain behind in this manufacture, and I shall be greatly surprised if the census reports of 1880 do not show a largely increased production from the dairy.

SOME ADVANTAGES OF THE STATE.

It was long ago asserted, and I am not aware that the truth of the assertion has ever been questioned, that the wealth of a State consists in its agriculture, manufactures and commerce. Considered with reference to either of these, there is no State possessing advantages superior to our own.

Aside from our long lake coast line and from our navigable rivers, the construction of railroads has added largely to our commercial facilities. In 1854 Michigan had 444 miles of railroad; in 1864, 898 miles; in 1874, 3,253 miles.

While that portion which I am speaking of as Northern Michigan had ten years since not to exceed fifteen miles, it now has 590 miles of railroad. We have every reason to believe, then, that the development of Northern Michigan in each of the three sources of wealth—agriculture, manufactures and commerce—will be increased in the future in a largely increased ratio over the past; in fact, this portion of the State is just ready to begin the work of improvement in earnest, and we may safely look for results accordingly. The older States every year send more and more of their hardy young men into this undeveloped country to seek their fortunes. They can find no better place. We welcome them to the labors and the profits of the work. There is enough to do. All that is required is intelligent labor to work out this latent wealth into productive capital. The western prairies, where the extremes of temperature, the fierce wintry blasts, unbroken by timber belts, and the recent terrible grasshopper scourge have proved so disastrous, are not considered so desirable as formerly. The result will be that Northern Michigan will be visited, its capabilities inquired into, and, being known and understood, we wish no further assurance.

I have not spoken of the production of salt, which admits of expansion only limited by a remunerative demand, nor of the immense water-power abounding throughout this Northern Michigan; nor of the educational facilities which, although the country be new, rival the older States. The time allotted me will not admit of detail, and I therefore content myself with these general remarks.

CONCLUSION.

Gentlemen, I have alluded briefly to a portion only of the resources of the country, to a few only of the many features which make this portion of the State desirable to the enterprising and the hardy pioneer. It is true that there are more or less hardships and privations attending a removal from an old and settled society into one in process of formation, but these here now are as nothing when compared with those endured and submitted to by the people who forty years ago settled the southern part of the State; and besides, pioneer life has its attractions. We all seek excitement and call it enjoyment. It permits time to pass unnoticed. In older societies this excitement is sought in recreation not always harmless—often the contrary. In pioneer life the excitement is found in the change that is constantly going on about you, which you are helping to produce. You feel that you are helping to build up a State and that you are a part of it. One never feels his own littleness and insignificance so much as when amid a throng. One never feels so independent, so much a man, as when on a farm all his own, subdued from a state of nature by himself. A more self-reliant people of independent thought cannot be found than in the portions of our own country undergoing the process of development. With such a country and such a people, considering the past and the present, the destiny of Northern Michigan is not a matter of uncertainty. Each may read it for himself. If any doubt whereof I have spoken, let him go and see for himself, and he will exclaim as did one on a former occasion, "The half has not been told me."

PROCEEDINGS OF THE WESTERN NEW YORK HORTICULTURAL SOCIETY.

REPORTED AND CONDENSED FOR THE MICHIGAN STATE POMOLOGICAL SOCIETY BY P. C. REYNOLDS, HORTICULTURAL EDITOR OF THE AMERICAN RURAL HOME, ROCHESTER, NEW YORK.

This distinguished Society has a Committee on Nomenclature, a Committee on American Fruits, a Committee on Foreign Fruits, a General Fruit Committee, and Committees on Entomology, Ornamental Trees and Plants, Garden Vegetables, Ornithology, and Botany. Its officers are as follows for 1875:

President—Patrick Barry, Rochester.

Vice Presidents—E. A. Bronson, Geneva; H. E. Hooker, Rochester; J. H. Babcock, Lockport.

Secretary and Treasurer—P. C. Reynolds, Rochester.

Executive Committee—W. C. Barry, Rochester; J. B. Jones, Rochester; E. W. Sylvester, Lyons; T. C. Maxwell, Geneva; E. Moody, Lockport.

Committee on Native Fruits—J. J. Thomas, Union Springs; Charles Downing, Newburgh; W. C. Barry, Rochester; S. D. Willard, Geneva; W. B. Smith, Syracuse.

Foreign Fruits—George Ellwanger, Rochester; T. C. Maxwell, Geneva; C. L. Hoag, Lockport.

Nomenclature—Charles Downing, Newburgh; P. Barry, Rochester; J. J. Thomas, Union Springs; D. W. Beadle, St. Catharines, Ont.; George G. Atwood, Geneva.

Entomology—Hugh T. Brooks, Pearl Creek; Dr. A. Merrill, Geneva; C. L. Van Dusen, Geneva; Mr. Saunders, Ontario.

Ornamental Trees and Plants—George Ellwanger, Rochester; W. S. Little, Rochester; T. C. Maxwell, Geneva; S. S. Graves, Geneva.

Garden Vegetables—E. S. Hayward, Rochester; John Crane, Lockport; J. W. Gray, Albion.

Ornithology—George T. Fish, Rochester; H. T. Brooks, Pearl Creek; David Henry, Geneva.

Botany—W. C. Barry, Rochester; J. J. Thomas, Union Springs; D. W. Beadle, St. Catharines, Ont.; C. M. Hooker, Rochester.

ANNUAL MEETING.

The twentiethth annual session of the Society began in the Common Council Chamber in the new City Hall, Rochester, Wednesday, January 6th, 1875.

The Society was called to order at 11 o'clock by the President, Patrick Barry, of Rochester. In his opening remarks he spoke of the importance of giving additional vigor and enterprise to the actions of the Association, and acknowledged the liberality of the press of the city in publishing full reports of their meetings whenever held. He was satisfied that the Society had done a good work already. The field was an extensive one, and there is still much to be done. He then spoke on the importance of fostering a horticultural taste, which would awaken an interest in the proceedings of the Society. The subject of fruit culture had made great progress, but there were still thousands of acres that could be profitably devoted to fruit-growing. He noticed that we were within twelve hours of the great fruit markets of the country. The culture of pears he also noticed could be progressed greatly now that the blight had almost disappeared. He then spoke of the prosperity of the Society, and on the importance of publishing its proceedings in pamphlet form.

In this connection the President spoke in high terms of the enterprise of the Michigan State Pomological Society, which had published a large volume of its transactions, and of their liberality in presenting our Society with some fifty copies, which would be distributed among the members, and should be appropriately acknowledged.

C. P. Avery was present, he said, as a delegate from that Society, and from the Peninsular Farmer's Club, with a collection of fine apples from both of the societies.

The Committee on Business reported the following subjects of discussion, after reports of committees should have been received:

1. How can the fertility of large orchards be most economically maintained?
2. What variety of apples, according to the latest experience, can be recommended for extensive market orchards in Western New York, for shipping?
3. Will the experience in pear culture thus far in Western New York justify the Society in recommending the planting of large orchards for profit? Can dwarf pear trees, or pear trees on quince stock be recommended for profitable culture? What varieties can be recommended to be grown as standards, for profit, and what as dwarf?
4. Would it be advisable for societies or individuals interested in pear culture to combine in offering a large reward for the discovery of the cause of the disease known as "fire-blight," and a practical remedy for the same?
5. What is the best kind of package for shipment of pears to distant markets?
6. Can this Society so far influence coopers as to have all fruit barrels made of legal size?
7. Can any action be taken by this Society to induce railroad companies to transport fruit on the same terms as any other farm product?
8. Can unity of action be secured among fruit growers for the destruction of the codling moth? What remedies for that and other insects injurious to apples have been tried, and with what results?
9. Can the blackberry be recommended for extensive cultivation as a market fruit, and if so, what variety?
10. Has the introduction of new varieties of fruit within the past twenty years been productive of any real advantage to the public?

11. What new varieties of fruit have given promise of superior merit in 1874, apple, pear, peach, plum, cherry, grapes and small fruit?

12. Planting country roads, streets, boulevards, etc., what are the most suitable trees? What the proper distance apart? Should the trees be planted in single or double rows, and be all of one sort, or mixed up to produce the best effect? What the best time for planting?

13. Plantations for shelter,—what trees most suitable, and what the most judicious arrangement as regards shelter and picturesque effect?

14. What are the best Magnolias for general planting in Western New York, and what the most favorable time for transplanting them? Does it increase the hardiness of the Chinese Magnolia to work them on the native species—*Acuminata*?

15. What varieties of the Clematis have proved hardy and otherwise desirable for planting in Western New York?

16. As an average in years, which is most profitable,—raising fruit for market, or raising farm crops and domestic animals?

17. What general selection of fruits and proportions of each would be best to keep up a yearly family supply?

18. What method should be adopted to secure improved varieties of fruits and vegetables?

REPORT ON NATIVE FRUITS.

J. J. Thomas, chairman of the committee on native fruits, read the following:

The committee present a few scattered notes on some of our native fruits, which are intended rather as suggestions to further trial and examination than as established facts. The chairman addressed most of the members of this committee, and has obtained some information, and as he has had no opportunity for conferring with any of the members since this report was written, he must take the responsibility of any errors it may contain.

Apples.—No varieties entirely new have been presented, but the suggestion is offered that more attention be given to a thorough trial of some varieties which have proved profitable and valuable in other regions of the country. Among these may be named—

The Champlain of Northern Vermont, a very fair and handsome fruit, whitish yellow, oblong conical, of a good, pleasant flavor, and esteemed as an agreeable table fruit. It is one of the most valuable and popular sorts cultivated on Grand Isle, the fruit garden of Vermont.

The Tuttle apple of Connecticut, of which specimens were forwarded by Charles Downing, is a rather large, roundish fruit, striped dark red, flavor pleasant, subacid, and good or very good in quality.

The Baker and American Golden Pippin, largely cultivated in some parts of Westchester county, are highly esteemed as market apples by some cultivators. The Baker is rather large, roundish, with broad red stripes and splashes on yellow ground, the flesh mild, subacid, aromatic, good or very good in quality. The American Golden Pippin is more generally known: a large greenish yellow fruit, with a mild, subacid, slightly aromatic, and very good flavor.

Chenango Strawberry is becoming gradually introduced into some parts of Western New York, and promises to become one of our best autumn varieties. Its handsome, lively red appearance and its pleasant flavor will be likely to render it popular.

In addition to these, President Barry informs us that he received, November 30, a splendid seedling apple from L. J. Fish of Martinez, Cal.; a seedling of Yellow Bellflower, large, golden yellow, firm, juicy, and rich, said to keep as well as the Newtown Pippin.

The chairman of your committee received from Charles Arnold of Paris, Ontario, specimens of four new varieties of the apple, obtained by crossing the Northern Spy, Wagener, and Spitzenburgh; one of which was a large and beautiful fruit, three inches high and nearly four inches in diameter, oblate, obtusely ribbed, deeply shaded and striped dark red on yellow ground, with a smooth, polished skin, a white flesh, tender, rather acid, and an agreeable and pleasant flavor, presenting the characteristics of both Wagener and Northern Spy, and if the fruit should always prove fair, and the tree a good grower and bearer in other localities, it would doubtless prove valuable as a market sort. This is mentioned as an encouraging result of crossing. The other sorts were less striking.

Pears.—From a few notes kindly furnished by our President, P. Barry, the following are selected:

A seedling of Flemish Beauty, from A. Foote, of Williamstown, Mass., is of full medium size, very handsome, half melting, and sweet. Foote's Seedling Seckel is large and fair, and fully equal to that sort in flavor. From the same source, a seedling pear named Hoosic, is large, resembling Beurre Diel, melting and of first quality. These were received October 5. About three weeks later, Foote's White Seckel was ripe, a very handsome, medium-sized fruit, with skin of a pale waxy white or straw color, not quite melting, but refreshing and very good. A week later, or at the end of October, a seedling Virgalieu, of large size, and very good, was received from the same source.

In addition to the above, a seedling pear received from Dr. S. L. Chase of Lockport is worthy of further attention. Had we seen it earlier in the season we should have pronounced it a large specimen of Doyenne Boussock, but this was ripe about the middle of October, and had some marks unlike those of the Boussock. Its large size, fine appearance, and good quality entitle it to further notice.

Peaches.—A great improvement has been made within a few years in the acquisition of several varieties much earlier than any good sorts previously known. The earliest which we have yet met with is Amsden's June, of which specimens were received from J. C. Teas of Carthage, Mo., on the 15th of July, which ripened on the 8th of July, and came in good condition. We were informed that they were some of the later specimens on the tree, and that in a previous year they had ripened on the last day of June. Allowing three weeks' difference between Western New York and Southwestern Missouri, it would bring the ripening of this peach at Rochester about the last of July or the first of August, or two or three weeks earlier than Hale's Early, and more than a week earlier than Early Beatrice,—a small, beautiful, and excellent foreign peach. Early Alexander may possibly be as Early as Amsden, but we cannot give distinct information on this point, not having met with it. The specimens of the Amsden which we received were about an inch and three-fourths in diameter. We were informed that some had measured two inches and a quarter, but they would not be so large grown farther north. A seedling peach of large size, fine form, and excellence of quality was exhibited at the late State Fair in Rochester by N. B. Hyatt of Pulteney, Steuben county, New York, which originated on the farm of G. P. Hayden of that

place. It bore a few specimens in 1873, and nearly a bushel last year. Through the omission of some technicality, it did not receive a premium, but Charles Downing and the chairman of your committee regarded it as a fruit of high merit and much promise, so far as they could judge from seeing the fruit alone on a single occasion.

Raspberries.—The chief attention to raspberries has of late years been given to varieties of the Black Cap. In addition to the older standard sorts, such as Davison, Doolittle, Seneca, and Mammoth Cluster, two varieties of merit have more recently originated in adjacent counties, namely, the Ontario and Ganargua. The Ontario is a good grower and bearer, and the fruit rather large and of good quality. While it will prove a good sort for the family, it is too dull in color to become a popular market variety. Ganargua is a very vigorous grower, quite spiny, a profuse bearer, and continues to ripen for several weeks. The only drawbacks mentioned against their wide culture for market are the successive ripening of the berries and their moderately showy appearance; while on the contrary, its rapid growth, early bearing, productiveness, and the perfect, well-rounded berries, distinguish it as a variety of much merit.

Grapes.—The great number of new sorts which, through the industry and intelligence of grape-growers, are springing up and presenting their claims in all parts of the country, render it impossible to give a full report, or to properly adjust their claims to popular favor. It is therefore suggested for the consideration of the Society, whether the appointment of a special committee on this subject would not be appropriate; to meet at a proper time in autumn at Rochester, Syracuse, or other central place, having previously announced such meeting, and invited grape-growers to send specimens of new sorts in sufficient quantities for thorough examination. The committee could in this way determine with considerable accuracy their qualities and claims as table grapes, by testing their relative degrees of excellence—although, as a matter of course, years would be required for determining their growth, productiveness, hardiness, etc., in different localities in order to settle all points relative to their merits, value and general adaptiveness. In this way we might have much more of the comparative excellence of such noted varieties as have been presented to the public by J. H. Ricketts of Newburgh, Jacob Moore of Rochester, J. B. Moore of Concord, Mass., Dr. Parker of Ithaca, G. W. Campbell of Ohio, J. W. Prentiss of Pulteney, N. Y., and many others.

Before closing, it may not be entirely out of place to mention a single hardy grape which has recently attracted some attention, and which we have had an opportunity of examining the past season. This is the Worden grape, now cultivated by B. Smith of Meridian, Cayuga county, N. Y. It has much of the appearance of the Concord, both in vine, bunch and berry, but is perhaps rather larger than the Concord, distinctly better in quality, and quite as early as the Hartford, as was evident on comparing the two sorts side by side growing on the same ground.

J. J. THOMAS,

Chairman of Committee.

The President remarked in relation to the Ricketts grapes that in his opinion they were the greatest acquisition the country had ever had.

A member asked for something farther about the Worden grape.

Mr. Thomas said it was worthy of attention. He compared it in hardihood and strength to the Concord.

A member asked for information in relation to the distinctive characteristics

of the Amsden peach, whether it had ripened naturally or some artificial means had been used?

Mr. Thomas was satisfied from the character of the grower, and other circumstances, that the peach was fully ripe.

Dr. Sylvester wished to say something further about the Worden grape. He had cultivated it for four years and found it a hardy grower and early enough for all practical purposes. It originated in Oswego, and, as it ripened in that climate, certainly ought to be successful in places south. His vines had fruited every year.

Mr. Tuttle of Wisconsin asked if Worden does not drop? Sylvester replied, Hangs as well as the Concord.

Mr. Craine of Lockport said that Rogers' 39 is the grape—earlier than Hartford—black, sweet, excellent.

The report of Committee on Nomenclature was now taken up. The President stated that the chairman of the committee, Mr. Downing, was unable to be present, but had sent his report in writing. This was read by the Secretary as follows :

REPORT ON NOMENCLATURE.

Kaign's Spitzenburgh and Long Red Pearmain.—Having been of the opinion for some time that there was an error as to these apples being identical, I have spent much time to ascertain if it was so or not, and have come to the conclusion that they are two distinct kinds, and that the fruit books, so far as I know them, have made a mistake in giving one a synonym of the other. Downing, in his second or last revised edition, has fallen into the same error. The description of Kaign's Spitzenburgh, except as to origin and growth of the tree, answers to that of the Long Red Pearmain, a variety known in many portions of the west under various names, but no author that I am aware of gives its origin. I have made inquiries of many pomologists and fruit-growers without success, until lately a friend informed me that the Economites at New Harmony, Ind., some time after taking possession of their property, some fifty years since, discovered a strong seedling tree, near a mud-hole, bearing fine apples, and gave it the name of "Mudhole;" and this is probably the origin of the Long Red Pearmain, as upon a close examination these two last appear identical. Many years since I obtained grafts from different persons, in various localities in the west, under the following names: Long Red Pearmain, Red Pearmain, Kaign's Spitzenburgh, Long John, Striped Pearmain, Park, etc., all of which were in fruit the past season, and were identical; besides, specimens of all the above varieties have been sent me during the past season, also Wabash Bellflower, Pound Royal of Indiana, etc., and all prove to be the Long Red Pearmain.

The following are the names to Long Red Pearmain, so far as I have been able to find out:

Red Pearmain; Kaign's Spitzenburgh, incorrectly; Long John; Red Spitzenburgh; Striped Pearmain; Lady Finger, incorrectly; Winter Pearmain; Long Pearmain; Red Winter Pearmain, incorrectly; Scarlet Pearmain, incorrectly; English Pearmain, incorrectly; Red Bellflower, incorrectly; Red Pippin; Red Phoenix; Pearmain; Kentucky Gilliflower; Kentucky Bellflower; Sheepnose of some; Hudson Red Streak; Wabash Bellflower; Russam; Park, not of Kansas; Mudhole; Pound Royal of Indiana.

The true Kaign's Spitzenburgh is a distinct variety, and has no synonyms

that I know of. This apple was first described by William Coxe in his work on fruit, in 1817; also by A. J. Downing, in his first edition of "Fruits and Fruit Trees," in 1845. I received grafts of this variety from the Coxe orchard about thirty years since, which was in bearing the past season on the same grounds with Long Red Pearmain, which gave me a good opportunity for comparison, and I am satisfied they are distinct.

I do not consider either Kaign's Spitzenburgh or Long Red Pearmain of much value, now we have so many better kinds, the object being to correct mistakes. If I am not correct as to the history, etc., of the above two apples, will some person who is better posted give us some light on the subject?

CHARLES DOWNING.

Since the meeting Mr. Barry has forwarded the following list of synonyms prepared by Charles Downing at their several dates:

Synonyms January 7, 1873.

Aromatic Calville.....	syn. to Aromatic Carolina.
Black Spitzenburgh.....	Flushing Spitzenburgh.
Black Sun.....	Black Coal.
Boston Pippin.....	Golden Pippin.
Belle Rose.....	Primate.
Conic June.....	Kirkbridge White.
Capp's Mammoth.....	Gloria Mundi.
Cranberry (incorrectly).....	Black Coal.
Early Washington.....	Sops of Wine.
Early Baldwin.....	Primate.
English King.....	Alexander.
French Pearmain.....	Autumn Pearmain.
Flat Vandevere.....	American Pippin.
Highland Pippin.....	Primate.
Hoover.....	Black Coal.
Jersey Pearmain.....	Autumn Pearmain.
Jenkins' Summer Pippin.....	Primate.
Large Summer Pearmain.....	Buckingham.
Lodge's Early.....	Summer Rose.
Moore's Shanty.....	Moore's Sweet.
Mountain Flora.....	Gloria Mundi.
Montgomery Sweet.....	Autumn Sweet Bough.
Pound Royal (incorrectly).....	Lowell.
Ryerson.....	Primate.
Russian Hagloe.....	Summer Hagloe.
Shelborne Sweet.....	Spice Sweet.
Shropshire Vine.....	Sops of Wine.
Virginia May.....	White Juneating.
Yellow May Pippin.....	White Juneating.
Tennessee Early Red.....	Early Strawberry.

Synonyms, January, 1874.

Byfield.....	syn. to Rock Sweet.
Broad Apple.....	Pennock.
Green Sweet of Indiana.....	Victuals and Drink.
Hoover's June.....	Yellow June.
Juniata.....	Washington Strawberry.

Jennings.....	Porter.
Jewett's Striped.....	Jewett's Best.
Kingsbury Russett.....	Pumpkin Russet.
Marilandica.....	Early Harvest.
Kentucky Gilliflower.....	Long Red Pearmain.
Queen of the Desert.....	Newtown Spitzenburgh.
Robinson's Streak.....	Ben Davis.
Rittner.....	Jackson.
Rolfe.....	Macomber.
Rock Apple.....	Lansingburgh.
Red Cheek Bellflower.....	Ewalt.
Striped Shropshire.....	Sops of Wine.
Williamson.....	Domine.
Welch's Spitzenburgh.....	Red Canada.
Waddell Hall.....	Shockley.
Washington of Maine.....	Washington Strawberry.
White Water Sweet.....	Wells' Sweet.

Additional Synonyms, January, 1875.

Bonford.....	syn. to Pryor's Red.
Early Congress.....	Gravenstein.
Fox Apple.....	American Golden Russet.
Fay's Russet.....	Hunt's Russet.
Farmer's Profit.....	Hubbardston Nonsuch.
Green Winter Pearmain.....	Autumn Pearmain.
Golden Russet of Massachusetts.....	Hunt's Russet.
Hoover.....	French Pippin.
Hare.....	Summer Sweet Paradise.
Heike's Summer Queen.....	Early Pennock.
Jefferson Pippin.....	Rawle's Genet.
Kennebec Seedling.....	Winthrop Greening.
Limber Twig Russet.....	Golden Russet of New York.
Logan's Northern Pippin.....	Minkler.
North Carolina Vandevere.....	Horn.
New England Russet.....	Hunt's Russet.
New England Golden Russet.....	Hunt's Russet.
Potter's Early.....	Knowles' Early.
Pound's July.....	Large Yellow Bough.
Red Harvest.....	Carolina Red June.
Russet Pearmain.....	Hunt's Russet.
Weidner.....	Early Ripe.
Wakeman.....	Baltimore.
Yellow Summer Pearmain.....	Porter.

REPORT ON ENTOMOLOGY.

Hugh T. Brooks of Pearl Creek, Wyoming county, chairman of committee, read the following report:

Your committee assure you that the bugs are having a good time generally. Nobody about here disturbs them much. When we don't like the taste of the worm in the apple we spit him out, and don't allow ourselves to *swear*, even when we habitually practice that vulgarity. When cucumbers and melons disappear we *expected* it, and meekly moralize on the transitory nature of

earthly things. Little given to resignation as a rule, we flare up terribly if somebody carelessly spatters our clean clothes or kicks our worthless spaniel; but we see worms devour our currants and cabbage with a look of heavenly resignation that beats all our Sunday attitudes.

Formerly, bugs seemed to respect the old Jewish arrangement, and took about a tenth. This we did not seem to mind at all; chronic grumblers said nothing, and horticultural societies didn't even inaugurate entomological committees. Bugs, like some other folks, being progressive, are frequently allowed to *take the whole*, and now, in their behalf, we feel authorized to extend to you assurances of their very distinguished consideration.

But the question now arises, How long can you continue this? Insect damages are known to exceed, every year, in the United States, \$1,000,000. There are many damages that money cannot measure. Shrubbery, watched and nourished with tender care, perhaps planted by loved ones departed, punctured by a little worm and turned to dry wood: can you enter that upon your ledger?

Assuredly, we need concerted efforts to overcome our insect enemies. We must all work together. If one man *kills* worms and another *breeds* them, the breeder will get on the faster. But where is the right to propagate nuisances? We might as well set up a pest-house as a worm factory; as well send out our pigs and poultry to depredate upon our neighbors as our codling moths.

We are informed that our Michigan friends have met the crises resolutely. One of their pomological associations resolved that if any fruit-grower neglected to bandage his fruit trees and destroy the codling worms, the society would do it for him. Every man did his duty, and the past year the fruit was greatly improved.

The Codling Moth.—This insect is receiving much attention from entomologists and pomologists everywhere, for it threatens our most valuable fruit, the apple, with utter extermination. Many orchards are rendered worthless by it. Orlando Kelly of Wyoming county, living in as good an apple district as there is in our State, says that nine out of ten of his apples had worms in them. The same is true of numerous orchards all through the country. A pomologist residing in one of the best fruit districts of Michigan, speaks of the apple crop as a total failure in consequence of the codling worm. Similar lamentations come from every quarter.

It gives frightful interest to these insect depredations when we consider that the repeated destruction and failure of the young fruit will lead to shy bearing and sterility from the *force of habit*. Animals that prematurely cast their young from injury, soon do so from force of habit; and we may well infer that trees which drop their immature fruit from the sting of insects, will soon utterly fail to perfect their fruit, even if insects do not trouble them. With trees, as with us all, *good habits* are quite indispensable to usefulness.

The codling moth came to us as one of the benefits of our foreign commerce. Our protectionists must have been asleep, or they would have subjected him to a prohibitory tariff. It illustrates the importance of entomological knowledge, when we consider how much we have lost by not *knowing these enemies, and suppressing them when they were very few*. If we had killed them all during the first two or three years of their sojourn, at an expense of a thousand dollars apiece, we should have made a good deal of money by it.

On the approach of warm weather the moth leaves its cosy silken nest, where it has spent the winter in the worm or larvæ state, finds its mate, and flies from tree to tree in the night, putting its eggs, about fifty in number, into the calyx of the apple and sometimes other fruits, and only one egg in a place, which is a very damaging circumstance, as the rascal spoils as many apples as it has eggs to bestow.

The eggs hatch in about a week, and in twenty or thirty days we have a pinkish worm which has eaten its way to the core of the apple; it now comes out and finds some crevice or shelter, where it spins up and remains from twelve to eighteen days in the chrysalis state, and then comes out to enter upon its mischievous work. This is a beautiful little moth, very seldom seen, ash-gray and brown, with a large tawny spot, streaked with bronze and gold, on the inner angle of each front wing.

The second brood appear from the middle of July to about the middle of August, and are by far the most numerous and destructive. We should kill the first brood, and then we are rid of the second.

This codling nuisance, like certain devils in Scripture, don't yield to mild treatment. You can't frighten them with scarecrows, nor coax them with sweets, but you must fight them by any and all methods known in civilized warfare.

1. Examine trees and pick all wormy fruit, which you will readily detect by the rusty excrements that protrude from the orifice and by the color of the calyx. Put this fruit in water or destroy it. Picking and thinning our fruit cannot be commended too highly. We thus get *size and quality*. Large, fine fruit measures well, and sells very high when brought to the right market.

2. Carefully remove all moss and rough bark in early spring, so that the worm cannot find shelter on the tree.

3. As soon as the apple is formed, or about the middle of June, take strips of cloth or strong paper, twelve or fourteen inches wide, and double into three folds; put them round the body of the tree, and tie them fast with cotton yarn, or fasten with a tack. Two or three bandages are better than one. About the middle of July take off these bandages, and with your fingers mash any worms that have taken lodgment there, and replace the bandages. Do this every week, or at farthest every ten days, till the last of August. Examine again a month later.

4. Whenever practicable, let hogs or sheep, or both, occupy the orchards, as some of the fruit falls to the ground before the worm leaves it, though generally he gets into a safe place before he falls.

It has been suggested that the instinct of the moth induces it to avoid depositing its eggs in trees that are frequented by dangerous animals, and those who have studied most into the inscrutable nature of animal instincts will not dismiss the suggestion without consideration.

Mr. S. B. Peck, a Michigan pomologist of much observation and experience, believes that the same worm frequently enters and destroys several apples, for you can always find a great many more bad apples than you can worms.

My friend, Mr. Oliver Chapin, has just put into my hands the following from the report of a Western pomological meeting, and I ask you to observe for yourselves and see how much there is in the suggestion:

"D. B. Weir made a report on entomology, devoting most of his remarks to the Turnished Plant-bug (*Capsus oblineatus*), which has done great damage to growing vegetation. He attributes much of the sterility, so-called, of apple,

pear, and other trees to this insect, which sucks the juice from the peduncle or stem of the blossom. The scabby and irregular fruit, when grown, he also says, is caused by the insect puncturing the growing fruit. The various acari also do much damage to raspberries and blackberries by sucking the sap from the leaves while in growth, thus depleting the plant of its vitality, and much of the damage attributed to winter-killing is due to this minute insect."

May we not hope that the above remedies will be vigorously applied? The Colorado potato beetle is now a subject of great anxiety in our State. Next in importance to wheat the *potato* demands our best endeavors for its protection and preservation. So great has been the destruction of this household necessity at the West by grasshoppers and drought that it is at present in many sections the dearest article of food in the market. It has been a very profitable crop in this vicinity, and we cannot urge too strongly that growers here should make a *concerted and determined* effort for the destruction of its relentless enemy.

We need scarcely inform any grower that the potato bug may be rendered harmless by dusting the vines with Paris green mixed with fifteen times its bulk of flour, ashes, or plaster. Repeated applications of this is perfectly effectual. It is probable that its stay with us will be short, as this and several other insect pests have a more congenial climate at the West, where they originated, than here. From careful inquiry we learn that they have put in appearance this year in every part of our State, doing some, but not serious, damage; and those who kill the bugs will profit by the indifference and neglect of those who do not.

Paris green may perhaps be used so freely as to poison the land, but the amount required for the destruction of the insect will do no damage whatever. The beetle does not eat the vine, but when the little yellow eggs on the lower side of the leaves hatch, the slug, or larva, commences the work of destruction; then you must apply the remedy without delay. The Paris green may be dusted on early in the morning by a large pepper box attached to a handle two feet long, care being taken to keep to the windward, as it is a concentrated poison.

Perhaps a better way is to dilute a tablespoonful of the green in a painful of water, stir it well, and sprinkle the vines carefully with it, using a water-pot with fine holes, so constructed as to concentrate the liquid more than is usual.

We have two or three crops of worms in a season, and we earnestly recommend picking the first ones off, as perhaps that might save the necessity of future applications; but if this is not done, it may be necessary to dust and sprinkle three or four times.

Your entomological committee, Mr. President, feel that they have very grave responsibilities. A great many women need aid and comfort in their domestic difficulties. We hate to mix ourselves up with private affairs, but we can't help it. Husbands expect and require good dinners from poor materials. They are absurder and meaner than the old Egyptians who wanted "brick without straw." A good kitchen garden is one of the *possibilities* of rural life. In its best state it is a perfect fountain of good things, but every tin peddler knows that our country gardens are a fizzle and a fraud on the women who coax them into a feeble existence, when they are allowed to "go to the bugs!"

Currant sprouts cost nothing, but being *persistent growers*, we had them

and they did great service. The worm spoiled the currants, and we meekly gave them up.

Now, this is to bear witness that white hellebore dusted on the bushes when the dew is on will save the currants, and any one who has lost his bushes should forthwith replace them and take care of them.

One of two or three things that we expect to find in country gardens besides weeds is *cabbage*. A green worm about an inch long acquired a taste for them and quietly took them.

Sprinkle on soapsuds, or salt, or dust from the road, and the worm will be disgusted. Shake into the cabbage cayenne pepper, or sprinkle on boiling hot water, and you will soon be rid of him. A moderate application of hot water will not injure the plant, as it has a thick, tough leaf.

Coop a hen among your squash vines with a brood of chickens, and the chickens will take care of the squash, if you only plant plenty of seed.

Don't fail to put boxes, twelve inches by fourteen, round your cucumbers, and ten inches high. Do this when you plant, and then it will be done. Neglected gardens don't pay: well cultivated ones *do* pay.

We conclude by earnestly invoking your aid during the coming year in a determined effort to rout all our insect enemies. We demand it as a duty you owe to your country and your kind.

Allow us to ask that you will communicate with this committee in reference to your success and disappointments: give us your experiments and experience.

Do all you can,—at least do something. The man who can lay his hand in yours, and, looking you in the face, declare that he has killed, or very seriously crippled, one codling worm, has not lived in vain, as we fear some people have.

Dr. E. Ware Sylvester, of Lyons, read the following report on the same subject:

Phylloxera Vastatrix.—Since the last meeting of this Society, the reports in reference to the success of the sulphuret of carbon seem to be in a measure contradictory; at all events, it has as yet not been so successful as to command the entire confidence of the grape-growers. In some portions of Europe the *Phylloxera* extends rapidly, while in other sections the vines seem strong enough to resist the attacks of the insect. A congress has been, or is about to be, held in Paris, to discuss the subject: and there are eleven questions proposed for consideration at this meeting, embracing the whole range of topics connected with this disease.

Some carefully instituted experiments by the Department of Agriculture at Washington seem to establish two facts, so far as one series of experiments can do: That the leaf-gall louse (*Pamphigus Vitifolia*) is not identical with the root-gall louse (*Phylloxera Vastatrix*); and second, that the root-gall louse will transfer itself to neighboring vines, and is catching as small-pox is catching. Experiments in Europe favor the last conclusion.

The main remedy appears to be: healthy vines, well cultivated. This has made a demand in Europe for cuttings and vines of our stronger American vines (our own beloved Concord among the number), which are reported there as having vigor of constitution sufficient to resist the attacks of the *Phylloxera*.

In this country the disease does not seem to be spreading rapidly, and if our vineyardists exercise their usual common sense, and do not give their vines the gout by over-feeding, or the *Phylloxera* from under-feeding, there is in all probability a successful future for the American grape growers.



SALIX. (WILLOW.)

S. Babylonica. Babylonian or Weeping Willow. A native of Asia. Our common and well known Weeping Willow.

S. purpurea pendula. American Weeping or Fountain Willow. A dwarf slender species from Europe. Grafted five or six feet high, it makes one of the most ornamental of small weeping trees, hardier than the *Babylonica*.

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Rochester, N. Y.

Canker Worm or Army Worm.—*Anisopteryx Pomataria*.—These worms have nearly disappeared from the neighborhood of the writer, having been destroyed by a late frost, parasite, or some other agency. Some attempts at destroying them were made with partial success, but the very general failure to put in an appearance is due to some cause not human.

The Currant or Gooseberry Worm, which has so long deprived many of currants, has mainly moved eastward, and was last season luxuriating in the vicinity of New York city. A very small supply of white hellebore was sufficient to destroy the few that remained in this vicinity, but we have a new aspirant for attention. It feeds on the currant and gooseberry leaves, and is named

Ellopia Ribearia.—It is easily distinguished from the other gooseberry worms, from the fact that it is a measuring or span worm, about one inch long when full grown, quite yellow in color, with white and black spots. It appears in June, attains full growth in July, goes into chrysalis state, emerges a yellow miller with spots, and deposits its eggs, which do not hatch until the following summer,—a very fortunate circumstance, as it gives us but one brood for a season. When the worm is disturbed on the bushes, it spins down to the ground like the canker worm. But the unfortunate thing about this visitor is, he seems to relish white hellebore; perhaps he thinks it for an appetizer. I shut up several in a ventilated box with an abundance of hellebore, but they were alive and in fair condition after a week. C. V. Riley (the accomplished entomologist, to whom the fruit-growers are under many obligations), suggested that my hellebore was not good; but I used some from two different stores, either of which were effective on other worms. I made a strong decoction of tobacco, and placed them in it, but it had no more effect upon them than an old pipe does upon an old smoker. I made a strong solution of Buchan's carbolic compound, but it would not destroy the *Ellopia*.

Mr. Riley suggested Paris green and water on bushes not bearing fruit, but the *Ellopia* had all retired into the pupa state before his suggestion arrived. As there is but one crop of them in a season, we can hand-pick them. It is recommended to all members of the Society who have stock in this new arrival, to experiment next season, and find some easy method of extermination.

The Colorado Potato Beetle seems to be gradually moving eastward in irregular columns, and is less destructive than at the West. It was in the midst of us during the last summer, but did not seriously diminish the amount of the potato crop. It is thought by those who have tried it, that if taken in season they can be exterminated with Paris green, at an expense of about five dollars per acre; and in some localities a parasite has come to our aid, so that these beetles are by no means a source of so much anxiety as formerly.

Mr. A. C. Younglove said it is very difficult picking off the new currant worm described by Dr. Sylvester, as they are very active, and hide among the leaves.

REPORT OF THE COMMITTEE ON ORNAMENTAL TREES, ETC., BY GEO. ELLWANGER.

There having been fewer novelties introduced than usual in the way of hardy ornamental trees and shrubs during the past year, it has occurred to us that an enumeration of the various hardy *Magnolias* might prove acceptable in place of our usual report of newly-introduced ornamental trees and shrubs.

Among the many materials offered to the landscape gardener for the adornment of the lawn, the park and the pleasure ground, the *Magnolia*, in its



TILIA EUROPÆA—VAR. ALBA PENDULA.

(WHITE-LEAVED WEEPING LINDEN.)

White-Leaved Weeping Linden. A very beautiful tree, with large foliage, and slender, drooping shoots.

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numerous species and varieties, claims his special attention as one of the most desirable in the entire list of ornamental trees and shrubs. While there are many other arboreal productions, each possessing its own valuable characteristics, and which are indispensable in every well-arranged place, there is no tree or shrub, in our opinion, whether deciduous or evergreen, that can compare with the *Magnolia* in effectiveness, or take its place in all well laid out public or private grounds. Its superior stateliness of form and splendor of growth, the size and richness of its foliage, and its lavish yield of fragrant flowers, all tend to place it in the foremost rank among hardy ornamental trees and shrubs.

Its proper place is on the lawn, where it shows to fine advantage in contrast with the green; or it may be planted effectively on the border of lawns, with an evergreen in the background to heighten the contrast. Planted in groups, it yields to no rival, and its effect in the early spring is grand beyond description, illuminating the whole landscape and loading the atmosphere with its rich perfume.

The *Magnolias* are all either indigenous to America or Asia, and occupy very similar parallels of latitude. The Chinese varieties possess the peculiarity of coming into bloom before the appearance of the leaves. On their own roots they are all of slow growth, growing at best into low, bushy trees, and on that account are admirably adapted to be planted with the larger varieties of shrubs, or to claim a place in small grounds where there is not room for anything larger. Where the space is abundant, however, to give room for a finely developed tree, they should be budded on the *Magnolia acuminata*, which adds materially to their vigor, hardiness, shapeliness and size. The French inarch them on the *purpurea*, a dwarf Chinese variety of less vigor than the others, but more easy of propagation. The *acuminata*, however, is far preferable with us.

The *Magnolia*, very erroneously, has long been considered by many a tender tree. This idea has obtained prevalence, doubtless, from its extreme shyness to being transplanted. No roots, to my knowledge, are so sensitive to the exposure of the wind, or sun, as are those of the *Magnolia*; hence the poor success in transplanting them.

It often occurs that after being moved they survive for a few months, maintaining a sickly existence, and having made no roots, perish in the winter, thereby, unfortunately, strengthening the impression that they are not a hardy tree.

To ensure success in their transplanting, they should be moved in the spring, never in the fall,—and the Chinese varieties at that period when they are coming into bloom, and, consequently, before the leaves have made their appearance. Great care should be exercised in their removal, the fibrous roots being preserved as nearly as possible, and carefully guarded from any exposure to wind or sun. For this purpose a cloudy or rainy day is preferable. While almost any good soil is sufficient to ensure their growth, they succeed best in a soil which is warm, rich and dry.

The varieties embraced in the annexed list, with but one or two exceptions, are all of sufficient hardiness to endure the rigors of even a New England winter. On our own grounds we have a number of specimens over thirty years old, as hardy and thrifty as our native oaks. In enumerating varieties I shall call attention only to those which have for years come under my observation on our own grounds.



MAGNOLIA SOULANGEANA.

(SOULANGE'S MAGNOLIA.)

M. c. Soulangeana. Soulange's Magnolia. A hybrid raised from seed at Fromont, near Paris. In habit it closely resembles *M. conspicua*. Shrubby and branching while young, but becoming a fair sized tree. Flowers white and purple, cup-shaped, and 3 to 5 inches in diameter. Foliage large, glossy and massive. It forms a handsome tree worked upon the *M. acuminata*. One of the hardiest and finest of the foreign Magnolias.

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AMERICAN VARIETIES.

The *Magnolia acuminata*, or Cucumber tree, as it is often called, from the resemblance of the young cones to a cucumber, forms in its well developed state one of our noblest and most finely proportioned trees, often growing in our forests to a height of sixty or seventy feet, and attaining a diameter of several feet. The leaves are large on young trees, and the flowers, which vary from five to six inches in diameter, are yellowish white, tinted with bluish purple. In autumn the cones open, displaying the coral-colored, polished seeds, and adding greatly to the charm of the tree. The *Acuminata*, as previously mentioned, is invaluable as a stock upon which to work the Chinese and other slow-growing varieties.

The *Magnolia acuminata variegata* is a variety of the preceding, with the foliage and young wood striped with yellow. It is also of superior growth, and is very distinct and fine. It originated on our grounds about fifteen years since.

The *Magnolia tripetala*, one of our best known varieties, is of medium size with immense leaves, growing in clusters, and large white flowers five to seven inches in diameter. This variety is seldom seen with a single stem. Its natural habit is to throw offsets from the base of the trunk, which, when allowed to grow, add to its attractiveness. Its period of flowering is June, and while not nearly as fragrant as the Chinese varieties, its immense leaves at the end of the branches and showy cones of seeds render it a highly ornamental tree.

The *Magnolia Thompsoniana* is one of the most unique and attractive of its species. Any one who has passed a tree in bloom, or even possessed one of its wonderfully fragrant flowers becomes enamored of it at once. The *Thompsoniana* is a hybrid of the *glauca* and *tripetala*. It commences to flower about the middle of June, continuing more or less during the summer. It is the rarest as well as the most fragrant of all the *Magnolias*. It is, however, difficult of propagation. It continues growing until the latter part of September. The young wood does not always ripen well on young plants, and should be protected with straw or mats during the winter, and planted where they will be sheltered from the west and northwesterly winds.

The *Magnolia glauca*, or swamp laurel, is of low growth, with extremely fragrant flowers and laurel-like leaves. As its name indicates, it is a favorite of moist soils, never succeeding on limestone soil, unless budded on the *Acuminata*. Owing to its bushy growth and handsome, fragrant blossoms, it is extremely valuable as an ornamental shrub.

The *Magnolia glauca longifolia* is a variety of and similar to the foregoing, but different from it in being more vigorous and in its finer foliage.

The *Magnolia macrophylla*, were it not for its sensitiveness to the cold, would prove one of our most invaluable ornamental trees. It is a native of North Carolina, where it grows very luxuriantly, the flowers and foliage both growing to extreme size. The *Macrophylla* is among the rarest of the native *Magnolias*. It is not hardy as far north as New York in exposed situations. If planted, however, with judgment, in warm soil and a protected situation, it often does well. At any rate it is worthy of a careful trial. We have had it flowering on our grounds for several years.

CHINESE VARIETIES AND THEIR HYBRIDS.

Magnolia conspicua (Chandelier or Yulan). In many respects this is the finest of the Chinese varieties. We have always held it in the greatest esteem,



THE MAGNOLIA.
MAGNOLIA ACUMINATA.
(CUCUMBER MAGNOLIA.)

A beautiful, pyramidal-growing tree, attaining from 60 to 90 feet in height. Leaves 6 to 9 inches long, and bluish-green; flowers yellow, tinted with bluish purple; fruit, when green, resembling a cucumber; hence the name. See above cut.

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owing to its being the earliest flowering of all the Magnolias, as also from the matchless whiteness of its flowers. If placed in contrast with evergreens or the *Forsythia viridissima*, which begins blooming at nearly the same time, its effect is almost startling. It has aptly been christened "Chandelier," for there is nothing to compare with it in lighting up the landscape of early spring. Its flowers are large, white, and extremely numerous, often numbering thousands on a single tree.

Magnolia soulangeana. This fine variety is a hybrid of the *conspicua* and the *purpurea*. While in general habit it closely resembles the former, it lacks its wonderful effectiveness, owing to the flower being tinged with purple. Coming in blossom, however, a few days later, the flowers are not so liable to injury from the late spring frosts in the Northern States. Perhaps the *Soulangeana* has been more disseminated in this country than any other variety.

Magnolia Norbertiana. It is also a hybrid between the *conspicua* and the *purpurea*. It differs from the varieties previously mentioned, in its flowers being much darker, and, therefore, we regard it as superior to the *Soulangeana*. This variety is still scarce.

Magnolia Lenne. The *Lenne* seems to be closely related to the *Norbertiana*, and is doubtless of similar parentage. In color it is darker, and in size somewhat larger. It is a decided acquisition.

Magnolia speciosa. In habit of growth this variety resembles the *Soulangeana*. The flowers are smaller and of a lighter color. They also come into bloom a few days later, and continue some days longer than any of the other sorts. It is a remarkably profuse bloomer. For florists it is the best for cut flowers.

Magnolia purpurea (Chinese purple.) The *Obovata* is a charming dwarf variety, hardly ever seen over five or six feet high. It has showy purple flowers, and blooms in the latter part of May or in early June.

Magnolia rubra (Chinese red.) This is a variety of the preceding, of more slender and erect habit, with larger flowers of a deep purple color.

TREE AND HERBACEOUS PÆONIES.

Mr. W. C. Barry, from the same committee, presented the following report:

Two artists there are—the writer and the painter—whose duty it is, each from his own standpoint and after his own manner, to describe and picture facts and objects so that they may be at once and unmistakably realized and recognized by minds of all capacities. But all will acknowledge that the value of their means for this work are not to be compared. The painter has at hand the inexhaustible resources of his palette, which enable him to represent colors and forms the most diverse, while he at the same time addresses himself to the most powerful organs which realize the slightest shades and appreciate the differences between them. On the other hand, the writer has at his disposal but a few technical terms insufficient to express his ideas—which ought to be palpable, materialized, so to speak. These terms, of which the signification is very limited, can not give expression to an unlimited number of things, the harmony of which exists in the depth of striking contrasts, which the most gifted of painters accomplish only with the greatest difficulty; while the writer sinks beneath his task, and is only prompted to do his best, trusting that the fancies of his readers will add the finishing touches which the brain imagines, but to which language can not give utterance.

Fully impressed with the difficult task of attempting a description of these



SIBERIAN ARBOR VITÆ.

Siberian Arbor Vitæ. The best of all the genus, for this country; exceedingly hardy, keeping color well in winter; growth compact and pyramidal. Makes an elegant lawn tree; of great value for ornament, screens and edges.

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Rochester, N. Y.

beautiful flowers, we trust our hearers, appreciating our position, will be indulgent, assured that their minds and fancies will amply compensate the insufficiency of our means. We think it is safe to assert that, at the present time, no class of plants of equal value is receiving less attention in horticultural literature than the Pæony. Is it because the Pæony is too well known, and therefore common? or because it is not deemed worthy of notice? If such be the case, we cannot concur in such opinions, and if we shall do something towards awakening and reviving interest in this one of the most striking and valuable floral productions of China and Europe, we shall be pleased.

Pæonies are commonly divided into two classes, Tree and Herbaceous, the latter again divided into sub-classes. The former is a native of China, and was first noticed in the year 1656, on the return to Europe of the first embassy of the Dutch East India company. The attendants of this embassy having had freer access to that country than had been granted to any previous embassies, visited all the country from Canton to Peking, even the gardens of the Emperor; and as the result of this visit, published a work describing, among other things, the Pine Apple, the Tea Plant, as well as the magnificent flower of the Moutan, or Tree Pæony. This volume, however, received little attention, being considered only as a collection of travelers' tales. The description of the Pæony therein given was very full and complete, but the plant remained unknown in Europe until the late Sir Joseph Banks gave instructions to several merchants trading at Canton to inquire for the Moutan, and numerous plants were imported in the year 1794.

It is said to have been cultivated in China for upwards of 1,400 years, and some of the Chinese authors say was first discovered growing among the mountains in northern China, whence it was brought into the southern provinces, and there cultivated with the same mania as tulips have been in Europe, some choice varieties of the Moutan having been sold in China for 100 ounces of gold. The Tree Pæony sold at high prices when it first came into the hands of nurserymen at London, Monsieur Noisette, a nurseryman in Paris, receiving for them more than \$300 each. This Moutan is the parent of all the beautiful varieties of tree Pæonies now cultivated. Tree Pæonies fill up a blank between deciduous flowering trees and flowering shrubs. In mixed borders they are invaluable, as well when grown as single specimens on the lawn. They are quite hardy, but slight protection greatly improves them. They thrive in any good garden soil, enriched with well-decayed manure. September and October are the months best suited for their planting. Good plants set at this time produce quantities of flowers the second or third year after planting. Each year the plants increase in size and beauty, and soon become the most showy and attractive features of the garden. They are the first of any of the varieties of pæonies to flower, and put forth their blooms early in May. Being naturally of what is termed slow growth, they are not propagated by division to any great extent, but chiefly by grafting upon the roots of the herbaceous varieties, which is done in August. The grafts are placed in frames, where they unite, and are transplanted the succeeding year into nursery rows.

To assist those who desire to form a collection, we name the following choice sorts. Any description, however complete, would fail to do them justice, so we only give the distinguishing colors.

Alba Variegata.—One of the most striking double varieties. The outside petals are pure white, and center purplish red.



YOUNG'S WEEPING BIRCH.

Young's Weeping Birch. Mr. Young, to whom we are indebted for this tree, says: "The ordinary Weeping Birch is generally and deservedly admired, as one of the most graceful objects in our landscapes, so that beyond a brief description of its origin it is not necessary to say more of this variety than that it is *the most beautiful* of all the Weeping Birches. It was found in the neighborhood of Milford, England, some few years ago, trailing on the ground, and it was with some difficulty grafted on stems, and now forms pendulous heads, drooping to the ground in fine, thread-like shoots several feet in length."

Arethusa.—Light rose, shaded with purple. This is a very large and fragrant variety, and a vigorous grower.

Banksii (Chinese Double Blush).—Pale rose-colored flowers, four to six inches in diameter.

Gumpperii.—One of the finest kinds, producing bright rosy-pink flowers of great size and perfection.

Incarnata Flore Pleno.—A fine white variety; fine, large, fragrant flowers.

Kochlerii.—This is a choice dark rose-colored variety. Blooms large and plant vigorous.

Le Ferreiana.—A very large and showy variety; bright pink flowers with rosy center.

Pride of Hong Kong.—A striking variety; flowers of great size, light cherry-red with purple center.

Reine Elizabeth.—Blooms of immense size; rosy-crimson in center, shading off to a light rose toward the margin.

Rosea Odorata.—Rose tinged with lilac; very large and flat.

Schultzei.—A beautiful and fragrant kind; carmine-colored flowers deeply shaded with rosy lilac.

Zenobia.—A large, fine, white variety.

Herbaceous Pæonies are usually classified as *Officinalis*, *Paradoxa*, and Chinese varieties,—the two first being European and the third Chinese sorts. These flower in succession, the first being the *Officinalis* varieties, then the *Paradoxa*, and the Chinese last. The Chinese varieties are particularly fine, and we regret not being able to give such a description as would induce every person who is the fortunate possessor of a garden to plant the entire collection. Herbaceous Pæonies increase rapidly in size, and soon form a large clump, and like all herbaceous plants, they should be divided occasionally, and the thriftiness of the plants will thus be greatly promoted.

The most gorgeous floral exhibition we have ever seen was an acre of Pæonies in full flower. Will you review with me some notes made on the ground?

Ambroise Verschaffelt.—This is one of the newest kinds, and up to the present time one of the best dark varieties known. The flowers are purplish crimson and full.

Carnea Striata.—Flesh-color, striped with red; very fine.

Charles Verdier.—Another new and superb variety, producing light rose flowers, of great size and perfect form.

Delachii.—A striking and beautiful dark variety. Flowers purplish-crimson.

Festiva.—This is a sort of which too much cannot be said in praise. Whoever possesses a plant of *Festiva* Pæony has something which will procure more pleasure and greater satisfaction than money can afford, applied in any way you choose, or in the acquisition of any object whatsoever. Imagine a plant three feet high, with beautiful dark green, glossy foliage, and peering away above ten to fifteen large heads of bloom, each six to nine inches in diameter, pure white, marked here and there with bright streaks of carmine, just enough to show how pure the white is and how beautifully the carmine contrasts with it. Match this with an *Ambroise Verschaffelt* or a *Delachii*, and you have a picture, or a pair of them, fit for the great and mighty ones of the earth to admire, but within the reach of the humblest citizen to possess.

Grandiflora Carnea Plena.—A variety of extraordinary size. A nursery



WEeping MOUNTAIN ASH.

American Mountain Ash. A tree of coarser growth and foliage than the European, and producing larger and lighter-colored berries.

European Mountain Ash. A fine, hardy tree, head dense and regular; covered from July till winter with great clusters of bright scarlet berries.

Weeping European Mountain Ash. A beautiful variety, of rapid growth and decidedly pendulous and trailing habit. One of the most desirable lawn trees. (See above cut.)

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row of this, with its hundreds of enormous white blooms, edged with blush, is something to gaze at and admire.

Alongside, in another row, we see *Humei*, with its large and showy purplish rose flowers. Such a profusion of beauty: it seems too bad that it must fade and pass away. Now we come to *Jules Lebon*, with its brilliant and distinct carmine-red flowers.

Louis Van Houtte—Is one of the dark crimson sorts, which produce a marked contrast among the fancy-colored varieties.

And another, the *Louis Van Houtte* (Calot's introduction),—bright purplish cherry color,—is a charming sort.

Here we see in quick succession *Marechal Vaillant*, a new kind, of a dazzling purplish-violet color, *Mad. Victor Verdier*, crimson rose, with light violet, very large and full.

Monsieur Bouchardlat.—A superb variety, of a bright rosy lilac color, large and full; flowers imbricated like a rose.

Plenissima Rosea Superba.—Very large, globular, and full; deep rose color, slightly tinged with salmon, and what a relief to meet a dark sort again!—the well-known *Pottsi*, dark purplish-crimson,—but now superseded by finer sorts of similar color.

We have now reached the tallest grower and most showy variety in the collection, called *Purpurea Superba*, producing very large purplish-crimson flowers.

Queen Victoria—With its immense blooms, outside petals rose, inside flesh-colored,—is another sort, which might be justly styled gem of the collection.

But we have seen enough. We must leave the examination of many other varieties for another visit.

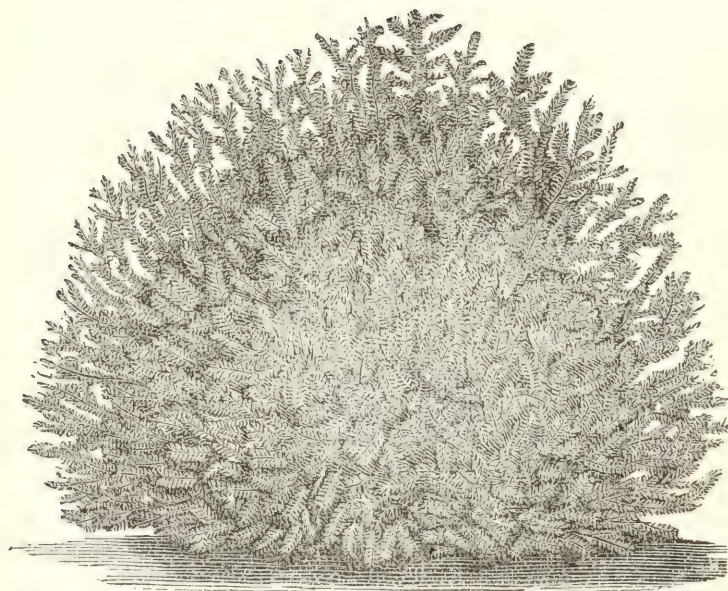
Mr. Crane of Lockport stated that the chairman of the committee on garden vegetables was absent. He had, during the season, been paying more attention to the cultivation of tomatoes. He had been pleased with the Hathaway variety, and was disappointed in Gen. Grant. On good soil it was rough and poor.

Mr. Crane saw an experiment by a woman in treating the cabbage worm with a strong solution of soft soap. It destroyed the worms without injuring the cabbage.

REPORT ON ORNITHOLOGY.

George T. Fish of Rochester, chairman of committee on ornithology, read the following:

Your committee on ornithology have nothing that will be particularly new to report at this time, but we regard the subject sufficiently important to demand "Line upon line and precept upon precept." A report was prepared for the last annual meeting, but none of the committee being present when reports were read it was not submitted, but after some changes was published in one of our daily papers. While it is pretty generally admitted that birds as a class are benefactors, there are nevertheless those, and among them some intelligent horticulturists, who wage war upon certain species because of their fondness for fruit. It is thought by some that as the birds have not entirely exterminated our insect enemies, their assistance is of little consequence. A French naturalist ascertained by careful investigation that a single insect might, in five generations, become the progenitor of five thousand millions of descendants. With these appalling figures before us we are forced to the con-



DWARF AMERICAN ARBOR VITÆ.—TOM THUMB.

Tom Thumb. A dwarf variety of the *American Arbor Vitæ*, which originated on our grounds. It is remarkable for its slow growth and compact, symmetrical habit. We have no hesitation in recommending it as an acquisition of much value in the class of small, hardy, evergreens, for the decoration of gardens, lawns, or cemeteries, where large trees may not be admissible. Will be found useful for small evergreen hedges.

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clusion that were the birds destroyed, a desolation would result, compared with which the grasshopper plague of the West would sink into insignificance. The vocal melody of birds would give place to constant buzzing, scraping, hissing sound of insects, not long, however, to be endured, for the destruction of vegetation must inevitably be followed by the destruction of animal life. It is evident God designed that the birds should hold the insects in check. Can we afford to dispense with even a part of their assistance because it costs us something in fruit? We are willing to pay money for fertilizers and for labor. We even pay men for destroying insects, and regard it as a profitable investment. It is unreasonable to demand that the entire work of the birds shall be gratuitous. The tax which nature levies if not paid willingly may increase with time, but can no more be avoided than that levied by the laws of man. Men may sometimes be cheated—nature never. Who can doubt that the voluntary tax which is now being levied in the interests of humanity upon the people of this country in behalf of the western sufferers, might have been to a great extent avoided by planting forests as homes for the birds on our western plains? In view of the generous response to the calls of the needy, ought not the following couplet to be changed?

“Man’s inhumanity to man
Makes countless millions mourn.”

That it may conform to the professions of modern civilization, and at the same time be more classical, we suggest that it should read:

Man’s inhumanity to birds
Makes countless insects buzz.

The prosperous manufacturer annually recognizes the aid he receives from those in his employ by a Thanksgiving dinner or a holiday gift—this in addition to the regular wages. The birds work “without money and without price,” and we begrudge them a holiday in our cherry trees; or, if after their summer’s labors are concluded they assemble in the vineyard to partake of a Thanksgiving dinner and to congratulate themselves on the millions of insects destroyed, we meet them with a *warm* reception of *cold* lead.

It is said of the American savage that if he is slow to forget an injury, he never forgets a kindness; but how different with the civilized American! By him the birds are destroyed while in the act of guarding his property. We seem to remember and cherish those traditions which call forth our combativeness, rather than those which develop our better nature. “He shall bruise thy head, and thou shalt bruise his heel,” seems to be remembered rather than the record in the same ancient book of a bird that bore across the wide waste of waters the olive branch of joy and peace.

The bird’s power of flight through the air must be of peculiar interest to man, until, in the march of improvement, those Utopian days shall come when he shall, in imitation of the feathered race, navigate the air with the same confidence that he now does the waters. What wonder that the Pantheist should worship birds! No other class of animals combine such rare beauty, grace, fleetness, endurance, sweetness of song, and skill in architecture. What a marvellous provision of the Creator that creatures which live on the most loathsome, noxious, and disgusting objects should notwithstanding be endowed with more points of superiority than any other of the lower animals! In view of their important mission, has not God endowed them with these wonderful attributes that they might find favor and protection even at the hands of the heedless and unthoughtful?



CAMPERDOWN WEEPING ELM.

Camperdown Weeping Elm. Grafted 6 to 8 feet high, this forms one of the most picturesque drooping trees. It is of rank growth, the shoots often making a zigzag growth outward and downward of several feet in a single season. The leaves are large, dark green and glossy, and cover the tree with a luxuriant mass of verdure.

ELLWANGER & BARRY.

But our report has assumed more the form of an appeal in behalf of our friends. In conclusion, then, we would recommend that the birds be protected. If an attack is made upon one species, the whole class accepts it as a general declaration of a war of extermination. Rather than attack any, let us plant hedges and groves to encourage the timid kinds which are fast disappearing from the more thickly settled parts of the country. With all the modern facilities, what more interesting study for the young than Ornithology? It is undoubtedly quite as good a discipline for the mind and far more useful to the young horticulturist than the study of ancient languages. We would recommend its study as an additional protection to birds and to our horticultural interests. While we should protect the birds as a class, we think experience has shown that the pugnacious character of the English sparrow renders him an undesirable settler. Our domestic birds, more peaceable in their nature, incline to leave him the whole field, and we think his introduction to this country no improvement on nature's plan. It would seem to be better to encourage by every means an increase of our native tribes.

GEORGE T. FISH, *Chairman.*

Mr. Maxwell asked if any one could explain why the robins went south last fall before the Delaware grapes were ripe, contrary to their usual custom.

Mr. Hooker suggested they came to Rochester, Mr. Younglove thought they all emigrated to Vine Valley, and Mr. Sylvester was sure a large delegation was sent to Lyons.

Mr. Craine of Lockport said he thought the robin was a poor insect destroyer. A few wrens and phæbe birds would destroy more insects than a thousand robins, the latter waging war principally on angle worms and other harmless varieties.

Mr. Thomas said that too much care could not be exercised in regard to the recommending or commending any kind of bird or even insect. It was very difficult to discriminate between those beneficial and prejudicial to fruit interests.

Dr. Sylvester—The report alluded to English sparrows. This bird has the reputation of destroying fruit as well as insects: is there any person here who *knows* that it destroys fruit?

Mr. Fish—Robins destroy angle worms early in the spring, but afterwards feed upon others. We know that birds destroy both predaceous and destructive insects.

Mr. Craine had watched robins and observed that they ate angle worms in spring, and by the time it was too warm and dry for them, fruit began to ripen, and they fed upon that the remainder of the season. The King Bird destroys a great many insects, but it also destroys bees.

DISCUSSIONS.

The reports being all in, the discussion of the various topics presented was taken up. The first subject was as follows:

"How can the fertility of large orchards be most economically maintained?"

Mr. Oliver Chapin of East Bloomfield has plowed in weeds of all kinds, including thistles and quack, but has now seeded down. He plowed four inches in depth; trees have made good growth, but have not generally borne well. Trees from twelve to twenty years old, principally Baldwins. Soil gravelly loam, with a stiffer subsoil.

Mr. H. E. Hooker of Rochester said the fertility of small orchards could



SALISBURIA. (MAIDEN HAIR TREE OR GINKO.)

A remarkable tree from Japan, combining in its foliage characteristics of the conifer and deciduous tree. The tree is of medium size, rapid growth, with beautiful, fern-like foliage. Rare and elegant.

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easily be maintained by manuring and application of other stimulants. He was not in favor of plowing and thus breaking up the surface roots of the trees. His best bearing trees were those whose surface roots had not been disturbed in thirty years. Top dressing might be beneficial.

Mr. Reynolds wished to hear from men who had tried various experiments in their endeavor to maintain fertility.

Mr. Green of Rush said he had a young orchard approaching bearing age, and wished to learn some facts in regard to the use of sown corn, clover, etc.

Mr. Moody of Niagara advocated plowing, guarding against the breaking of tender roots. One great thing to be done in order to save our orchards was to destroy the fungi which attacked them. He had planted a 100-acre orchard, and was not intending to put upon it any stable manure. He thought the soil strong enough to sustain the strain without any help save from minerals. He looked for the greatest results from the use of salt and lime as fertilizers.

Mr. Root of Skaneateles found no difficulty in keeping up growth by plowing if you took off but one crop. Plow a few years until the trees come in bearing, and then seed down. Afterwards spade around the trunks and apply ashes, also washing with soft soap. If soil is stirred, it will increase in fertility if no crop is taken off.

Mr. Allis of Holley, recommended plowing. He thought the best plan was to sow buckwheat and then keep fowls to run in the orchard and eat the buckwheat and destroy the insects. He had noticed wherever he was that orchards bore the best apples where fowls were allowed to run at will in them.

Mr. Langworthy wished to inquire if any one present had tried girdling in June. He had seen the best results from this method. He thought it was the most beneficial in stimulating bearing.

Mr. Root had good results from this practice.

Mr. Smith of Syracuse wished to hear the man who had displayed such elegant fruit before the association. Therefore Mr. Avery of Michigan said that he came from a county which eight years ago was entirely occupied by maple growth. The land was quite new. They were not obliged to resort to plowing. About the middle of July they sow buckwheat, and when apples are ripe, walk into the orchard and pick them, paying no attention to the buckwheat, but just before winter plow it in, and it comes up the next season.

Mr. Barry said a large orchard must be treated exactly as a small one was. Every man knew that after a few years' bearing an orchard required feeding, and some source of strength must be discovered. He recommended the growing of root crops to feed cattle and use the manure for orchards. Many nursery men did this and found it profitable. In their own nursery they kept the ground constantly plowed, and gave an occasional top-dressing. But they found nothing so effective as stable manure. Apple orchards would not need so frequent dressings of manure as pear. He strongly recommended the use of salt, lime, ashes, manure, and various composts, etc., applied alternately.

Dr. Sylvester of Lyons planted his orchard twenty-eight years ago, and from less than ten acres had 1,000 barrels this year. He does not keep stirring the surface, because he believes it wastes the fertility. Does not believe in using large quantities of stable manure in pear orchards, for it would cause blight. If his trees make three inches of wood yearly, he is satisfied.

Mr. Chapin plows his trees and gets wood, but no fruit. What he is after is fruit, not wood. He manures with a mixture of muck and barn-yard manure. Another year will put on a light dressing of gas-lime, spread thinly over the



CLADASTRIS TINCTORIA.—*syn.* VIRGILEA LUTEA.

(YELLOW WOOD.)

One of the finest American trees, resembling the Robinias, with long racemes of white, sweet-scented flowers in June.

ELLWANGER & BARRY,

Rochester, N. Y.

surface in autumn or winter. A compost of muck and gas-lime is not expensive. In answer to question, has used over 2,000 bushels of gas-lime, at the rate of 120 bushels to the acre. Has put on four loads to the acre, fresh from gas house, around the apple trees in winter without injury. He composts gas-lime with muck, but not with barn-yard manure. Lime is not in itself a manure, but decomposes fertilizing substances locked up in the soil. The sulphur is separated from the lime by the frosts of winter so as to do no injury. If he could obtain neither muck nor gas-lime, would apply plaster, ashes and lime. Apples would probably go on bearing indefinitely if we removed no fruit. His orchard that has not been plowed in eighteen years, received something every winter,—muck, ashes, lime, etc. Does not want to take off the grass, but would mow it and let it rot.

Mr. Smith of Syracuse thought that the use of gas-lime was worse than useless. He wouldn't have it on his place. The use of just such fertilizers was of no good whatever. Theory wouldn't fertilize the soil. If the trees were given the benefit of the products of the soil, whether grass or anything else, they would be all right.

Dr. Sylvester—My neighbors say that I always have fruit, while they fail on similar soil.

Mr. Root thought the case depended altogether on the nature of the soil. A stiff clayey soil wanted stirring up, and a light sandy soil did not require it.

Mr. Lay said he found the best results arising by allowing hogs to run in the orchard.

In response to a question, Mr. Barry said that coal ashes were very good for clayey soil, and also recommended their use on other kinds of lands.

Mr. Crane has made experiments with coal ashes and manure, and had seen double the results from their use.

EVENING SESSION.

Vice-President H. E. Hooker in the chair.

The discussion of the first question was resumed. Hugh T. Brooks of Wyoming said that fertilizing orchards is a pressing necessity. Most of our orchards are half starved, and in consequence not half so productive as they might be. People had better think twice before they plant large orchards, unless they are sure of a large supply of manure. He would not speak of pear trees, but apples require more manure than is generally supposed. He made a hog-pen near an apple-tree forty years old, and in ten or fifteen years it had doubled its size and productiveness. God makes a better soil than you can. A virgin soil is best, and should not be required to produce other crops if planted to orchard. The tree and the fruit take from the soil a great variety of elements, among which are potash, lime, and the phosphates: these should be supplied. About thirty per cent of the leaf of the apple-tree is lime, which should be supplied. Lime is serviceable for the necessary material it furnishes, and as a corrective of the noxious matter in the soil, and also to quicken and render available inert material. Being available in unlimited quantities, and cheap (which can not be said of most manures), we ought to use it very largely on all soils that require it, and most soils do require it. Mulching trees with weeds, coarse manure, muck, sawdust, shavings, coarse grass, and about everything else, furnishes some good material to the tree, protects from drouth, and



WEeping POPLAR.

keeps the soil in a loose and desirable condition. Remember that you must manure with everything that you carry off with the crops.

J. J. Thomas did not believe that the same rule would apply to two different neighborhoods. He knew a nurseryman who raised fine trees with ashes, but they failed with him.

Mr. Craine thought the next best thing to barnyard manure is to plow under green crops. Why don't they furnish all that we get from barnyard manure?

The second topic, "*What variety or varieties of apples, according to the latest experience, can be recommended for extensive market orchards in Western New York?*" was then taken up.

Quite a number named Baldwin, Greening, and Russet. Brooks named Twenty Ounce. Maxwell said it cost as much to grow two barrels of Greenings as three of Baldwins. Herendeen named Maiden's Blush. Some one named Northern Spy.

Mr. Babcock named Baldwin, Greening, Roxbury Russet, Twenty Ounce, King, and said that the Mann apple is very promising with him at Lockport.

Of all the varieties mentioned, the one almost universally favored was the Baldwin. Considerable discussion, however, for the first place was excited between the friends of the Baldwin and the Hubbardston Nonsuch. In some respects it was admitted that the latter excelled the former in flavor, but was not so good a keeper, nor was it by any means so good an apple for market purposes.

Dr. Sylvester stated that years ago, when Horace Greeley offered a prize for the best apple for the million, he was on the committee of award. The prize was awarded the Baldwin, but the Hubbardston Nonsuch was the next in favor.

Mr. Thomas spoke in regard to the different varieties most likely to be attacked by worms, etc. He mentioned the Westfield Seek-no-Further as resisting the attacks of the codling moth. He considered it one of the best apples for family use.

Mr. Ely of Brighton considered the Northern Spy the poorest apple one could raise for market purposes. Liable to spot and decay, they were disliked by dealers, as they could not be kept.

Mr. Tuttle of Wisconsin said that in his State they could not grow Baldwins or Rhode Island Greenings. The Northern Spy was formerly regarded by them as extra hardy, but of late it had degenerated and would not keep well, whether raised there or brought into market from abroad. The Baldwin and the Rhode Island Greening, therefore, were regarded as the best apples they could find in the market.

Dr. Sylvester spoke in favor of the Tompkins County King, saying that they had obtained a higher price for it than for any of the others. Members from other parts of the State, however, stated a different case. Some objected to the quality of the Baldwin, but the fact that it is such a great and uniform bearer, good color and good keeper, commends it to the grower of apples for profit.

Mr. Lazenby of Cornell Institute had seen the King in Ithaca in fine condition in June, and it sold for \$3.50 a barrel.

The third topic was then taken up, as follows:

"Will the experience in pear-culture thus far in Western New York justify the Society in recommending the planting of large orchards for profit? Can



BETULA. (BIRCH.)

ALBA PENDULA ELEGANS.

At the Paris Universal Exposition in 1867, this tree attracted marked attention, being exhibited there for the first time. The accompanying engraving gives a correct idea of its habit of growth. The branches run directly towards the ground, parallel with the stem. Its elegant pendulous habit, beautiful foliage and branches, entitle it to be regarded as one of the greatest acquisitions of many years in this class.

dwarf pear-trees or pear-trees on quince stock be recommended for profitable culture? What varieties can be recommended to grow as standards, for profit, and what as dwarf?"

Mr. Willard answered: "Yes, on proper soils." Some said: "Yes, if of proper varieties;" and others answered in the affirmative, provided they received proper culture.

Mr. Maxwell would answer the portion of the question relating to dwarfs in the affirmative, if they received proper soils and culture, and were of proper varieties.

Dr. Sylvester has an orchard of dwarf pears, in grass, which he manures every year, and it has paid him over \$500 per acre yearly. His Louise Bonne have averaged \$1,000 an acre. It don't cost him more than \$10 an acre for manure, while farmers will put \$20 worth of manure on an acre of corn.

Mr. Moody recommended the Beurre d'Anjou and Duchess for growth on quince stocks.

Mr. Rathbone of Genesee did not think Beurre d'Anjou equal to the Duchess, and in his experience it was by no means so fine a grower.

Dr. Sylvester said the Louise Bonne would grow double the quantity in the same field that the Duchess would.

Mr. N. Bogue of Batavia read the following statement: Ten years ago last October, Mr. John Taylor of Elba, Genesee county, planted three acres to Dwarf Duchess. The cost of the trees was \$500. Estimated cost of preparing ground and setting trees, \$200, making, as first cost on the orchard, \$700. For the first six years there was no fruit marketed from the orchard. The first crop sold was twenty barrels of choice quality. Three barrels were filled each with 150 pears. This crop brought \$10 per barrel, making \$200; eighth year, 180 barrels at \$6, \$1,080; ninth year, 220 barrels at \$5, \$1,100; this year, 204 barrels at \$5.50, \$1,122. During this time potatoes have been grown in the orchard of sufficient value to pay all expense of culture and rent of ground. Cost of trees and setting, \$700; interest on same, \$490; total, \$1,190. Received from same, \$3,502—less \$1,190, leaves \$2,402, or a profit of \$240.20 per year for three acres, or \$86.06 for one acre. Now, this is not *all*, for the orchard has just begun to bear, and the ratio of profit must be greater as the trees continue to grow.

Mr. Sharp had two pear orchards, one a success and the other a failure. The cause of the failure was that no cultivation was put upon it. His two orchards taken together, however, were profitable, and more so than raising wheat or any other grain.

Mr. W. C. Barry said that the trouble with manuring trees was that no judgment was used. In their grounds no manure was used until the trees gave evidence of requiring stimulus. This was then put on in the fall, and is not used again until the trees again look unthrifty.

Considerable discussion then followed upon the question whether it was or was not profitable to cultivate pear trees in this State. The greater part of the members seemed to think pears would pay if proper judgment was used in regard to soil, varieties and cultivation.

Mr. Barry said pear culture was a success, if only men knew how to choose the proper mode of treatment. Probably there were but few men in the meeting who knew even how to prune a pear tree properly.

Mr. La Rue thought there are more failures than success in pear culture so many trees are destroyed by the blight. One or two gentlemen from Yates



IMPERIAL CUT-LEAVED ALDER.

Imperial Cut-Leaved Alder. This charming variety is as yet very little known, owing, no doubt, to the difficulty experienced in its propagation. It is a stately tree, of graceful, slender growth, with large and deeply lacinated foliage; at the same time vigorous and perfectly hardy. Unsurpassed as a lawn tree.

ELLWANGER & BARRY,
Rochester, N. Y.

county, Mr. Ely of Rochester, and some others thought the numerous failures from blight very discouraging to pear culture.

Mr. Willard declared that nothing had been offered to prove that pears on a proper soil, with proper culture, and with proper varieties, are a failure.

THURSDAY'S SESSION.

The president, P. Barry, in the chair. The president announced the presence of Mr. J. J. Harrison of Painesville, Ohio, delegate from the Ohio Pomological Society.

The discussion of the third question was resumed.

Mr. Moody of Lockport said many failures arose from selecting poor ground. They want good culture and dry ground; in such a case he thinks pears can be grown as cheaply as apples, and with as good profit.

Mr. Chapin said his five acres on wet land were successful, yielding good crops, while the balance of the thirty acres on good wheat land failed.

President Barry would not recommend pear culture in the way it is generally done, but it must be done in the right way. Farmers must cultivate their crops properly to succeed, and so must pear culturists. Land must be dry. Can be drained from \$50 to \$60 an acre. In 1865 they planted five acres of select varieties, mostly late. They stood in nursery, surrounded by nursery stock, and received no extra culture. About half of the trees were Lawrence; remainder Bosc, Anjou, Clairgeau, etc. They have borne for several years, and bore last year a good crop of fair fruit. Clairgeau ahead in productiveness; Lawrence produced nearly half the fruit; is a moderate, uniform bearer. We are remarkably well situated for fruit culture, being within ten or twelve hours of Boston, New York, and Philadelphia, the best markets on the continent. How much better situated in this respect than California!

Fourth question—*“Would it be advisable for societies or individuals interested in pear culture to combine in offering a large reward for the discovery of the cause of the disease known as pear blight, and a practical remedy for the same?”*

Mr. Smith thought the blight was growing less. He proposed that a premium should be offered some scientific man to investigate the “pear blight.” Too high culture, he thought, would increase the blight.

Mr. Bronson said his experience confirmed Mr. Smith in his assertion that high culture would increase the blight.

Mr. Barry said manure should be applied as a top dressing in the fall: plowing in he considered dangerous.

Dr. Sylvester gave his experience of a remedy for the blight,—diluted carbolic acid,—which he had used for three years. He thought the infection was carried by the saw from tree to tree. He therefore directed the saw to be wiped off with carbolic acid. He thought we might find in this a remedy, though we do not know the cause of the disease. Uses one ounce of crystals to a gallon of water, applying with a swab to stump of limb.

Mr. Thomas said he had done nothing, and his trees had not been affected by the blight.

Thomas Wright had a tree which blighted, all but a sprout, which he saved by cutting off the rest. Since had done well.



SALIX ROSMARINIFOLIA.

(ROSEMARY-LEAVED WILLOW.)

Rosemary-leaved Willow. When worked 5 to 7 feet high, a very striking and pretty round-headed small tree. Branches feathery; foliage silvery.

ELLWANGER & BARRY,
Rochester, N. Y.

The question (No. 5) was then taken up. It is as follows :

"What is the best kind of package for shipment of pears to distant markets?"

Dr. Sylvester said he had been compelled to change his style of package. During the war he had shipped in crates, but since then so much inferior Southern fruit had been shipped in that form that they had become unpopular. At present ships pears in half barrels, except very choice ones, which he ships in bushel crates, every one wrapped in paper.

Mr. Babcock gave his experience in shipping early pears a long distance. He found that open crates had done the best for him. In barrels they often arrived at their destination over-ripe.

Mr. Maxwell and Mr. John Morse of Cayuga Bridge used half barrels almost altogether.

Mr. Root inquired if pears would not lose their flavor in open crates.

Mr. Spence said New York men regarded half barrels as the best, but they should be aired.

Mr. Sylvester said airing depended upon the season. Early in the season he aired, but left barrels unaired late in the season.

Mr. Rathbone had found shipping in full barrels pay the best when the prices were low.

Mr. Parce of Fairport had found half barrels the best.

Mr. Barry spoke in favor of open crates.

The sixth question, which is as follows, was then taken up :

"Can this Society so far influence coopers as to have fruit barrels made of legal size?"

Mr. Sylvester thought this a serious matter, and recounted the efforts which had been made to change the law, as it now is. He had found it impracticable to get coopers to make their barrels the legal size. He told of his difficulty in procuring uniform packages.

Mr. Moody said the Niagara fruit-growers had got up a bill to inflict a penalty for making barrels smaller than the legal size, which passed the lower House, but was thrown out by the Senate.

Mr. Babcock read the draft of the bill in question, which is in the form of an amendment to the present law. He thought there would be no difficulty in procuring its passage by the Legislature. The making of small barrels, he said, often worked against the fruit-growers of Western New York. He wanted uniformity.

Dr. Sylvester said dealers in cities largely opposed legislation in this respect. He complained that barrels were not made uniform.

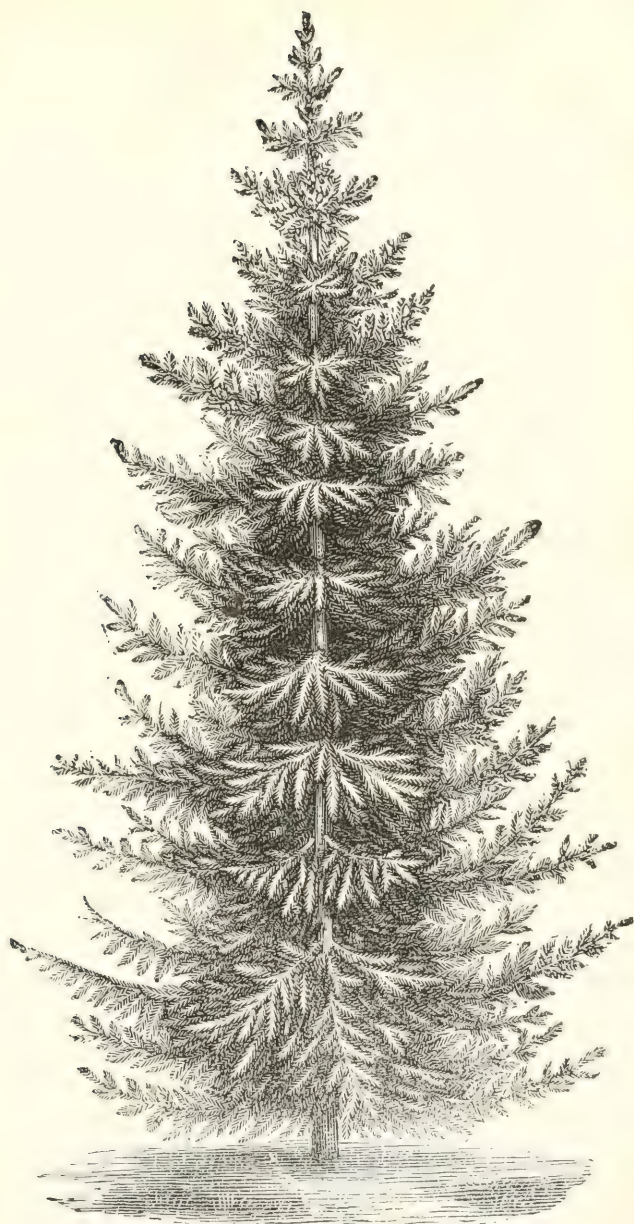
Mr. Chapin recounted the difficulty of making barrels exactly the same size. He did not think barrels could be made uniform.

Mr. Babcock said what we wanted was a restriction against making barrels smaller than the legal measure. He moved the appointment of a committee of three to procure the passage of a proper amendment by the Legislature. The motion was carried.

Question No. 7 was then taken up. It is as follows :

"Can any action be taken by this Society to induce railroad companies to transport fruit on the same terms as other farm products?"

Mr. Bogue of Batavia said there was a manifest injustice in shipping prices of apples from Batavia to New York. Potatoes were shipped for about half the sum that apples were.



NORWAY SPRUCE.

Abies Excelsa. Norway Spruce. From Europe. An elegant tree, extremely hardy and of lofty, rapid growth. The branches assume a graceful, drooping habit when the tree attains 15 or 20 feet in height. One of the most popular evergreens for planting, either as single specimen trees or in masses for effect or shelter. It is one of the best evergreen hedge plants.

ELLWANGER & BARRY,
Rochester, N. Y.

Mr. Chapin said the charges on grapes from Victor were 92 cents, while those on potatoes were only 25 cents.

Mr. Barry explained that it was on account of the more perishable nature of the goods that extra charge was made.

Mr. Younglove said he never knew a case where the railroad company had lost a dollar by goods perishing on the way.

Dr. Sylvester mentioned how the railroad company carried a larger weight of vegetables farther than they would carry fruits for the same price.

Mr. Sharp said the railroad companies would carry cheaper if we had some other means of sending them. They would then carry them cheaper without asking.

Mr. Willard said that railroad companies understood their business. He regarded the question as an impracticable one.

Dr. Sylvester moved a committee of three to confer with superintendents of freight in regard to transportation of fruits.

Judge La Rue moved an amendment that the committee also confer with express companies.

Dr. Sylvester accepted the amendment.

The motion was carried.

Question eight was then called up, which was as follows:

"Can unity of action be secured among fruit-growers for the destruction of the codling moth? What remedies for that and other insects injurious to apples have been tried, and with what results?"

Mr. Lazenby of Cornell Institute said that during the last season he had charge of a portion of the University farm. Studied with care the working of insects. Found on some trees 200 to 300 codling worms, only one in an apple. The orchard was mainly Kings and Greenings. Found most of the worms in the Kings, and but few in Greenings. Thought it might be because the calyx of the former was more open than that of the latter.

Mr. Green of Rush had tried Paris green on the potato beetle, and found that a small quantity was more effectual than a large. Used it as a solution, and found that when a small quantity, about a tablespoonful to three gallons of water, was used, they would eat the leaves wet with it, and die, but too much would repel them.

Mr. Craine endorsed Mr. Green's statement; said he could find stain of green on the leaves two weeks after,—stuck like paint.

Mr. Chapin recommended the destruction of the codling moth now, which could be found under the hoops of barrels in the cellars and in the bins. The seed for another year's crop would thus be destroyed. He advised destroying wormy apples and also inferior fruit. He thought the moth could be destroyed by a little labor.

Dr. Sylvester cautioned growers against using Paris green too freely.

Mr. C. P. Avery of Grand Traverse, Michigan, said they have a parasite—the lady bug—that is checking the potato beetle there. Some who used Paris green lost more potatoes than those who did not, as it destroyed the parasite as well as the beetle. He then proceeded to relate how they fought the codling worm in his section. The Old Mission Farmers' Club resolved that all the apple-trees on the Grand Traverse Peninsula—a tract about twenty miles long by one wide—should be bandaged last summer. If any individuals refused to do it, the club would do it at its own expense. The result was all bearing trees were bandaged. They used coarse brown paper, three thicknesses, folded fan-



PINUS AUSTRIACA.

(AUSTRIAN, OR BLACK PINE.)

Austrian or Black Pine. A native of the mountains of Styria. Tree remarkably robust, hardy and spreading; leaves long, stiff and dark green; growth rapid. Valuable for this country.

ELLWANGER & BARRY,
Rochester, N. Y.

like, so that the worms climbing either up or down the tree could enter the bandage and find a dark hiding-place in the middle. Bandages should be made from four to six inches wide after folding, and may be tied on with twine, or nailed on with tacks. They put them on about the time the Wilson strawberry begins to ripen, and ten days thereafter examine them, pinching the worms, or may run the bands through a clothes-wringer. They examine once a week through the season. The year before about one-third of his apples were wormy; this year in 800 bushels there was scarcely a wormy apple. Tied five bands on some trees, and found 200 worms on upper and lower, 60 on the next, and only 13 on the middle one. Just before winter they plow under the grass and weeds, and bury such worms as may cling to them.

Mr. C. M. Hooker said that Paris green will destroy the canker worm, if trees are dusted with it as soon as they appear.

Question No. 9 was then taken up. It is as follows:

"Can the Blackberry be recommended for extensive cultivation as a market fruit, and if so, what variety?"

Mr. Jones, Mr. Lay and Dr. Sylvester pronounced in favor of the Kittatinny. The tenth question:

"Has the introduction of new varieties of fruit within the past twenty years been productive of any real advantage to the public?" was the next in order.

Mr. Hooker thought we derived benefits from the introduction of new fruits, though not in a direct manner; but the only sense in which we have really improved is in developing new varieties, which are of advantage to us. We do not improve actually on the original given us by the Creator. To get size in fruit, we have to sacrifice something else for it.

Mr. Barry said that there was no doubt that many fruits of great value had been introduced during the past twenty years. He gave instances on this point. He also said that the introduction of new varieties stimulated progress in fruit culture. He spoke of the great success of Mr. Ricketts, who had introduced many magnificent varieties of grapes.

Mr. Brooks thought the society should thank all experimenters, whether they succeed or not.

The following resolution was adopted:

Resolved, That the thanks of this Society be and are hereby tendered to the Michigan State Pomological Society for its liberal donation of fifty copies of its valuable transactions for the year 1873, and for its courtesy in sending delegates and collections of splendid fruits to this meeting, and in giving publicity to our proceedings by printing them in the transactions. Carried.

The eleventh question was then taken up. It is as follows:

"What new varieties of fruit have given promise of superior merit in 1874—apple, pear, peach, plum, cherry, grapes and small fruits?"

Mr. Lay spoke of Rogers' Hybrids, Nos. 4, 15 and 39, as having done excellently with him.

J. B. Jones spoke of the Ganargua Hybrid raspberry. It claims to be a hybrid between the common black and red raspberries. It is vigorous, productive, firm to ship, a little tart; thinks it will make a valuable fruit.

Mr. Babcock was opposed to commending the Worden grape. It is so like the Concord that it is difficult to distinguish between them.

Mr. Smith of Syracuse, thought if Mr. Babcock could see them growing together, in the grounds of the originator, he would see the difference.



FRAXINUS EXCELSIOR—VAR. PENDULA.

(EUROPEAN WEEPING ASH.)

The common, well-known sort; one of the finest lawn and arbor trees. Covers a great space and grows rapidly.

ELLWANGER & BARRY,
Rochester, N. Y.

[The Secretary would here say that a mistake was made by the reporters of the daily press, and followed by him, in reporting J. J. Thomas as saying, in the discussion following "Report on Native Fruits," that the Worden grape is worthy of the *utmost* attention. Mr. Thomas denies using the word *utmost*.]

Mr. Younglove spoke of several varieties of grapes which promised well during the past season, especially Rogers' Nos. 4 and 43, as black grapes, which are very much alike. In red grapes, he spoke of the No. 15, and the Salem, which, at a certain stage, were not distinguishable. He said that the last year, however, the Salem cracked badly.

Mr. Long of Buffalo said the Salem mildewed badly with them last season, while twelve other varieties did well, and were fine. They have fruited Salem only one or two years, and know nothing of its profitableness.

Mr. Younglove said that the fruit of the Croton is the finest in quality of any, but mildew destroys it. Vineyards five or six years old are not producing, but going down hill.

Mr. Crane said that he found the Croton the reverse of what Mr. Younglove had found it. His vines are five or six years old.

Mr. Younglove said the originator of the Croton had admitted that it was a failure for vineyard purposes.

Mr. Babcock spoke of the keeping qualities of the Rogers' Hybrid grapes, which he thought were worthy of consideration.

Mr. Lay said the No. 15 kept even better than the Diana, and the flavor improves.

Mr. Quinby wanted something said about peaches. On his motion the question of peach culture was taken up. He said it was well known that a large trade was being done, and that it was very profitable. He gave statistics on this point, and the names of men who had succeeded well in peach-culture.

Mr. Barry said that the peach crop was, as a general thing, an uncertain crop. There were some spots, however, where they had succeeded.

Mr. Younglove hadn't seen a failure in his valley in ten years. He said they could make more with grapes than peaches, which did well enough as a "side issue." He pronounced grapes far more profitable than peaches.

Mr. Thomas spoke of the Early Beatrice peach as a very handsome fruit.

Mr. Langworthy spoke of the Buchan peach, which he thought would be an acquisition.

Mr. Hooker questioned the correctness of the name of the Champion grape.

Mr. Lay claimed that it was a Tallman seedling which was originated near Syracuse. He said the Tallman seedling varied on different soils.

Mr. Donnelly said a friend bought one of the first Tallmans brought into this city, and had since bought of him a Champion, and they were very *unlike*.

Mr. Barry considers it a promising grape.

The question whether plum-culture was profitable or not was then taken up at the request of a member.

Mr. Thomas said he had seen considerable of plum cultivation, and thought it was rather precarious. He said he had killed several trees by mistake in allowing them to overbear.

Mr. Barry said that plum-culture was being extended in the eastern part of the State and in the Western States.

Mr. Moody said plums succeeded well in Niagara county.

Mr. Quinby spoke of French and German prunes as doing very well.

Mr. Brooks offered the following resolution :



ABIES ALBA.
(WHITE SPRUCE.)

White Spruce. A native tree, growing 40 to 50 feet high, of fine pyramidal form. Foliage silver gray and bark light-colored.

ELLWANGER & BARRY,
Rochester, N. Y.

Resolved, That this Association looks forward with great interest to the approaching Centennial celebration at Philadelphia, and we promise to the gentlemen who have it in charge our hearty sympathy and co-operation, and our determination to be represented by a full delegation, and by the horticultural products for which our State is so widely celebrated.

REPORT OF COMMITTEE TO EXAMINE FRUIT ON EXHIBITION.

Your committee find the following articles on exhibition:

Messrs. Ellwanger & Barry of Rochester—50 varieties apples; 25 varieties pears, in fine state of preservation, making a splendid display for this season of the year.

Peninsular Farmer's Club of Michigan—50 varieties of apples, which show the superior quality and beauty of Michigan apples to great advantage.

Dr. Sylvester of Lyons—A seedling grape.

Messrs. Frost & Co. of Rochester—Beurre d'Anjou pears in fine condition.

M. B. Bateham, Esq., of Painesville, Ohio—Four varieties of new Western apples.

H. E. HOOKER, *Chairman*.

Mr. C. P. Avery handed the Secretary the following: The apples exhibited by Mr. C. P. Avery of Old Mission, as delegate of the Michigan State Pomological Society, were mostly grown in the town of Peninsula, county of Grand Traverse, by members of the Peninsula Farmers' Club of Old Mission, and the balance were grown at Ionia, Ionia county. This fruit was on exhibition at the annual meeting of the State Pomological Society at Ionia, December 1, 1874, and exposed one week to the handling of the people and the heat of a crowded room; consequently I am not as well able to show the keeping quality of our Grand Traverse apples by these samples as I should wish, owing to the previous handling. But by actual experiment in the same cellar with apples grown in the best apple sections of New York, I find the keeping qualities of the Traverse apples to be equal, and in most cases some four weeks longer. Being satisfied that much of the demand for cooking apples in the future is to be supplied by the new process of drying (or evaporating), especially during the latter part of winter and spring, we are now paying more attention to high-colored, subacid, long-keeping eating-apples, such as the Wagener, Jonathan, and Red Canada.

Adjourned *sine die*.

THE HOME, AND ORNAMENTATION OF HOMES.

BY MRS. JEREMIAH BROWN OF BATTLE CREEK.

GENTLEMEN:—You have given me a subject, significant, far reaching, and of deeper meaning than its simple title indicates. It is susceptible of endless illustration, and would require a wiser head and more skillful pen than mine to do it full justice. I trust that it will not be considered out of place here if I quote the words of the Rev. E. H. Chapin, for I imagine all who have arrived at the idea of adorning their homes realize the responsibilities that abide in that home, and will be strengthened in the desire to make it all it should be by the words of so eminent a thinker, which, if not given precisely in the line of our subject, yet seem to me very nearly connected with it. He says: "If we make home only a place to eat and sleep in,—if we are employed merely in making provision for it and securing temporal good; then the Divine purpose is *not* fulfilled." * * "In the soil of home grow filial love, fraternal affection, the sentiments of mutual dependence and mutual trust; yes, even the religious reverence which man carries into the higher postures of the soul, and by which he is taught to conceive of the Heavenly Father." The subject, then, of making homes attractive and educative, is fraught with vital importance to every individual, every community, every country; most especially to a Republican country.

HOME! The *sacredness* of home is our bulwark of safety. From this center radiates all that is known of honor, morality, patriotism and all the higher principles which endow a free people with wisdom for self-government. Then how imperative the duty to make a home such as will lead to the highest development of the minds and souls of its members.

In view of the inimitable ornamentation in all the works of the Creator, we are taught the lesson that this ornamentation is an essential teacher and inspirer to the souls that have been attuned to its appreciation, and every step taken in our homes, in this direction, is an advancement toward the higher and better.

In a large degree the home is what the mother makes it, what kind of an atmosphere her life and character breathes through it. Here again I must borrow the language of Dr. Chapin. "The most exaggerated conception of a mother's influence cannot furnish any reason for a father's neglect. * * * With all that she can do, the home that does not feel his sympathy is *not* a

home." Fathers, I pray you remember this and profit by it, and so aid the wife and mother to make a home such as will help to develop all the higher qualities of the soul and mind of your children. "The child will grow, the child will learn to think and feel. Whence shall come the breath of its very life, and the incentives by which it shall unfold for good or evil?"

But I am occupying too much space and time with abstractions. I must hasten to the practical, and hint at possibilities within the reach of even the unfavorably circumstanced. It is of course presumed that *comfort* in the home has been reached, before the idea of ornamentation has found admission.

HOW TO BEGIN ORNAMENTATION.

Do you ask *where* shall I begin? I answer, in your sleeping rooms. Let your children's eyes open each morning on a window shaded with a snowy curtain, if it be made only of ten-penny cotton, and in summer vines and creepers, if possible, should hang their verdant wreathes around it, and the cheerful morning-glory peep in to gladden the young eyes and hearts. Have some pictures, if they are only prints cut from some periodical; many of them are beautiful and artistically executed, and convey sweet and touching lessons of benevolence, sympathy and affection. If you can not, or do not wish to afford frames, lay them on a piece of stiff pasteboard, put a pane of window glass over each, and bind them by pasting around them a strip of dark fancy paper, which you can get at any stationer's, and an old pasteboard box can always be found about the house. A bright chromo, too, is very desirable, such as all our seedsmen and florists now send out, which 25 cents will procure, if you do not patronize them in any other way. Remember, "A thing of beauty is a joy forever," and the young eyes that have beauty to gaze upon have already in a degree learned to value it. Have your beds covered with white, no matter how cheap the material, for it is important that all the appointments of a sleeping room convey an idea of purity.

ORNAMENT THE KITCHEN.

The next most important portion of the home to be made attractive is the kitchen. A bright, amusing or comical picture or two can not fail to arrest attention, and will lighten the monotonous, ever-recurring, never-ending household duties to be performed there. In the warm season, hang green branches over the doors and windows, and at angles, for the double purpose of adornment and to keep flies from paint and walls. Let a bed filled with bright flowers lie before the doors, and creepers drape the windows and door casings, and be trained to shade them. Such surroundings divert the mind, make the toils of daily life less wearisome, and give zest to the performance of them.

There is no fear, with this attention to bed rooms and kitchen, that other rooms of the home will lack any effort that comes within the knowledge or ability of the ministering spirits, who find joy and

"Peace in love's unselfishness,"

and by adorning home, are ever

"Weaving through the poor details
And homespun warp of circumstance,
A golden woof-thread of romance."

THE COUNTRY.

to one who walks through it, with eyes to see, affords rare opportunities for gathering beautiful grasses, than which nothing is prettier or more graceful

to fill vases or group over pictures. From early June to November you can find them in great variety. They should be cut just when in most perfection of beauty; some when in full bloom, others not quite so soon, and be dried quickly in a warm, dark place, that they may retain their color. A dark closet is the best place. Some should be tied in bunches and hung up, others tied together and set into a glass, a vase, or a bottle will answer, that they may retain their erect or drooping habit, according to their nature. I consider it in bad taste to color grasses or mosses. If it is done great care should be taken to give them a *natural* tint, but they can be renewed every year, at least such as do not retain a pretty color, and this is preferable to coloring them. For those who like to attempt improving (?) grasses, let them dip them in gum water and then lightly touch them to Epsom salts, or sprinkle over them a frosting which can be procured at the druggists, such as is used on artificial flowers. In every walk you may take, you will find curious or pretty stones. The waters of every rippling stream, every murmuring river, or silvery lake, flow over, or lave on their borders, beautiful pebbles and shells, which, gathered and arranged, will form an interesting cabinet; and the shells, boiled in strong soap-suds and brushed clean, will become snowy white, and can be formed into various beautiful ornaments. Brackets, frames, wall and hanging baskets can be decorated with these shells. Cones can be used for the same purpose, and with these can be imitated the most exquisite wood carving. Indeed, if graceful designs are wrought out, no carving can equal them, and I know of no prettier sets of brackets, baskets and frames than can be made from these cones, taking them from those of the pine, Norway spruce (these large ones, the scales must be separated), Scotch pine and all, down to the smallest of the larches, and the tiny ones of the Arbor Vitæ. Flowers, leaves and buds can be represented with far more delicacy than by any carving. I use the best of glue to fasten them, and when varnished the rich shades of brown are beautifully brought out. One who has not seen fine work of this kind can not imagine how beautiful it is.



WINTER IN DOORS AND OUT.

This charming picture Mr. James Vick has made the subject of one of his chromos. It represents a stand covered with winter flowers, house plants, etc., while from the window are seen the leafless trees, the snow-covered hillside, and other evidences of winter.

For hanging baskets stiff pasteboard is used. These, tastefully made and filled with dried grasses or with mosses and everlasting flowers, are as pretty and ornamental as anything can be, even for the more richly appointed rooms of the wealthy. If you cannot, or do not (as it seems to me everybody should) cultivate a few plants, the Everlastings (*Helichrysums*, *Rhodanthas*, *Acrolinums*, and others of similar nature), make rather pretty, though somewhat artificial-looking winter bouquets, but are much better than no flowers. Most of them should be cut just as the buds are about to open, the very double ones can remain on until nearly fully expanded; then dry them as directed for grasses. I can not better convey my idea of how to ornament a home, where means are limited, than by describing my own living or sitting room.

OUR HOME.

First of all, our house is a small-windowed, low-roofed cottage, such as were built forty years ago. The walls are papered with a neat, light paper. There are two south and one east window, the sills of which are broad shelves filled with pots of geraniums, fuchsias and other plants. Near one is a flower stand, also filled with plants, among which are ivies and Madeira vines trained over a wall and picture. There are three hanging vases, with *tradescantia viridis* in one, *tradescantia zebrina* in another, and German Ivy, or *Sinaria*, in the third, all hanging from brackets fastened to the wall at suitable points, with some of their luxuriant branches trained over pictures that are near them. I have many bright flower chromos framed in the primitive manner I have described, and three or four other pictures, an engraving of American authors, a sunset scene on the Hudson (oil painting), and two other fancy pictures. The flower pictures are distributed around the room among the others, and around among them, arranged in such a way as to have the effect of vines trained about the pictures and over doors and windows, are delicate twigs and slender branches of the arbor vitæ. This has been renewed twice during the winter, and you may imagine that when the snow drifts were piled all over the country, and

“The wild wintry winds
Idly raved round our dwelling,”

we had the warmth and brightness of summer within. And so may all who do not mind a little expense, and love to make home pleasant and attractive.

In early summer I substitute asparagus for the evergreen. It is light and graceful, and will keep nicely for a week. Later, when the oaks mature their foliage (before, the leaves wilt quickly and omit an unwholesome odor), I use small twigs and branches of these trees. When in autumn colors, they are unexceptionably handsome for decorative purposes. Such is my home living room from year to year, and to my children I pray it may ever be a bright and inspiring picture in their memory.

Of parlor ornamentation I will only say, in mine, with hanging baskets, brackets and pictures, the treasures of sea and land have helped to instruct my children, and show to them how bountifully the heavenly Father has ministered to the love of the beautiful.

AUTUMN WORK.

Allow me to urge you, as autumn approaches, to secure an ample quantity of leaves as they assume their rich coloring. The sumac, with its scarlet, crimson and gold; the maples, rich in their varied and gorgeous tintings, each

leaf a picture of itself, with its dottings, shading, and veining, one is ready to exclaim :

“ See (and scorn all duller
Taste) how Heaven loves color :
How great Nature clearly joys in red and green,—
Utterance, mute and bright,
Of some unknown delight,
And a thousand flashing hues, made solely to be seen.”

These leaves are treasures for the decoration of homes. Take them as soon as the bright colors are developed, and have several folds of soft paper or cloth on a table, lay the right or upper side of the leaf down, pass a flat-iron, not hot enough to scorch, crisp, or fade the colors, over the leaf until it is rather dry. You can do many as they grow on the twigs, and for most purposes the arrangement is far prettier than any you can make. It is said that touching the leaves very lightly with a feather dipped in any thin kind of oil will improve their beauty. I have never tried it, but it is easy enough to experiment in that way.

Premising that you have a fine collection of ferns, which you have gathered and pressed as they have matured through the summer, with a store of these bright leaves you have the materials for lovely wreaths, groups, and bouquets, which will serve for a variety of very delicate and graceful adornment, particularly if you have pressed ferns. The common running myrtle pressed makes a pretty green to mingle with the colors. During the last winter I saw a suit of richly furnished parlors, whose walls and lace curtains were beautifully decorated with garlands, groups, and bouquets of these richly colored leaves. Among them was a delicate and exquisite tracery of green from pressed ferns. The effect was beautiful, exceedingly. While adorning our homes with the rich treasures so lavishly scattered around us, let us never forget that our

“Father made them all.”

He could have provided for all the needs of the body, without any regard to beauty. The life of the physical does not need it. Then, truly, its mission is evidently to furnish food for the soul, the divine in man, and it seems to me that it is almost crime to ignore it, as too many do. Every home in the country, however humble, should be set amid flowers, shrubs, and trees. Creepers should wreath and drape its doors and windows, that a portion of the grace and adornment of nature may smile upon its inmates, refining and elevating their ideas, inciting them “to look from Nature to Nature’s God.” I feel that in this my poor effort I have only reached the A B C of the “ornamentation of homes;” but if I lead one to see more of the good Father in His glorious manifestations of the beautiful, I shall be content. May all so live and learn as to more and more appreciate

“ * * * that unwearyed love
That planned and built and still upholds a world
So clothed with beauty.”

To each one let me say:

“ Acquaint thyself with God, if thou wouldst taste
His works. Admitted once to His embrace,
Thou shalt perceive that thou wast blind before :
Thine eye instructed and thine heart
Made pure, shall relish with divine delight.
Till then unfelt what Power Divine has wrought.”

PREMIUMS FOR ORCHARDS, VINEYARDS, AND NURSERIES.

AWARD OF PREMIUMS OF THE ORCHARD COMMITTEE OF THE MICHIGAN STATE POMOLOGICAL SOCIETY FOR 1874.

DIVISION A.—ORCHARDS, VINEYARDS AND GARDENS.

At a meeting of the Michigan State Pomological Society, held at Spring Lake October 14th, H. Dale Adams of Galesburg, Kalamazoo county, announced the following awards:

CLASS I.

For best apple orchard in bearing, for profit, planted not less than ten years, and not less than two acres in extent. First premium, diploma, N. E. Smith, Ionia. Second premium, Wm. Marshall, Old Mission, Grand Traverse county.

CLASS III.

For best apple orchard for profit, planted not less than five years, and not less than two acres in extent. First premium, diploma, George Parmelee, Old Mission; second premium, A. K. Montague, Traverse City.

CLASS IV.

For best apple orchard of 25 or more trees in number, planted not less than ten years. First premium, diploma, John Alliston, Old Mission.

CLASS V.

For best specimen apple orchard, 25 or more varieties in number. First premium, diploma, Reynolds & Tracy, Old Mission.

CLASS VI.

For best pear orchard for profit, in bearing, planted not less than two years, of not less than half an acre. First premium, diploma, C. Engle, Paw Paw, Van Buren county.

SPECIAL CLASS.

For best pear orchard, ten acres in extent, general good condition to govern. First premium, diploma, George Parmelee, Old Mission.

CLASS VIII.

For best peach orchard for profit, in bearing, planted not less than ten years, nor less than five acres. First premium, diploma, C. Engle, Paw Paw; second premium, J. B. Soule, Spring Lake.

CLASS IX.

For best peach orchard for profit, in bearing, planted not less than four years, and not less than one acre in extent. First premium, C. Engle, Paw Paw; second premium, Thos. Petty, Spring Lake, Ottawa county, Mich.

CLASS X.

For best peach orchard for profit, with succession, planted not less than one nor more than four years. First premium, diploma, J. B. Soule, Spring Lake.

CLASS XII.

For best plum orchard in bearing. First premium, diploma, J. B. Burney, Old Mission.

CLASS XIII.

For best plum orchard, planted not less than four years, and not less than ten trees. First premium, diploma, Peter Collar, Adrian; second premium, E. H. McCallum, Old Mission.

CLASS XIV.

For best cherry orchard. First premium, diploma, Elton variety, George Parmelee, Old Mission; second premium, English Morello variety, George Parmelee, Old Mission.

CLASS XVI.

For best quince orchard. First premium, diploma, C. Engle, Paw Paw.

CLASS XVII.

For best vineyard for profit, planted four years, not less than one acre in extent. First premium, diploma, N. and C. Chilson, Battle Creek; second premium, Antoine Weir, Monroe.

CLASS XX.

For best vineyard native grapes, in bearing, attached to village or city lot. First premium, diploma, John C. Zeigler, Saginaw City; second premium, Thomas Doyle, Monroe.

CLASS XXI.

For best Concord vineyard. First premium, diploma, George W. Bruckner, Monroe; second premium, N. E. Smith, Ionia.

CLASS XXII.

For best Delaware vineyard. First premium, diploma, N. E. Smith, Ionia.

CLASS XXIII.

For best vineyard for table use, with succession. First premium, diploma, Henrietta Bruckner, Monroe.

CLASS XXIV.

For best vineyard for wine. First premium, diploma, Pointe aux Peaux Wine Company, Monroe (12 acres in extent).

CLASS XXVIII.

For best plat red raspberries. First premium, the Philadelphia variety (7 acres in extent); George Parmelee, Old Mission.

CLASS XXXIII.

For best suburban ornamental grounds. First premium, diploma, S. O. Knapp, Jackson.

CLASS XXXIV.

For best garden attached to village or city lot. First premium, diploma, E. F. Guild, East Saginaw.

SPECIAL CLASS.

For best foreign grapery under glass. First premium, diploma, Artemas Sigler, Adrian.

CLASS XXXVIII.

For best collection growing hardy flowering plants. First premium, diploma, S. O. Knapp, Jackson.

CLASS XXXIX.

For best private plant house. First premium, diploma, S. O. Knapp, Jackson.

CLASS XLI.

For best general nursery. First premium, diploma, I. E. Ilgenfritz & Co., Monroe; second premium, John G. Greening, Monroe.

The second premium is a life-membership. The work of this committee is of the first importance, and it should be sustained by the united action of the State societies. It will be seen that the action of the committee pervades all sections of the State, and that the Grand Traverse section, together with Monroe, Van Buren, Ottawa, Ionia and Lenawee counties, win a fair share of premiums.

REPORT OF THE ORCHARD COMMITTEE FOR 1874.

BY CHARLES BETTS, AGRICULTURAL EDITOR OF THE DETROIT TRIBUNE,
AND CHAIRMAN OF THE ORCHARD COMMITTEE.

GENTLEMEN OF THE STATE POMOLOGICAL SOCIETY: The committee appointed to examine the orchards, vineyards, nurseries, gardens, etc., entered for premiums under the rules of the State Pomological Society, respectfully report that they have performed the duty assigned them with as much care and thoroughness as circumstances permitted. They beg to say, however, that could they have given more time to the work in each locality visited, this report might have embraced a wider range of subjects, and the committee would have been enabled to have gathered together here in a more systematic plan, a larger amount of practical information.

The real work of the Orchard Committee, or the true purpose for which the committee is sent out by the Society, as we understand it, is not merely to compare the entries made in the different classes with each other, and award the premiums to which such entries may be entitled, but also and chiefly to obtain from fruit-growers in the localities visited local facts in relation to the general business of fruit-growing,—embracing soils, varieties of fruit, adaptation of varieties to certain soils and locations, hardiness and feebleness of trees, productiveness and unproductiveness, etc., etc.; to gather up and bring together these facts, generalize and average them in a way which will make them of general interest and value, and which will afford to some extent a sort of chart or guide to whoever may wish to cultivate fruit or gardens, either for profit or pleasure, for commercial purposes or for home consumption.

THE ORCHARDS OF C. ENGLE, PAW PAW.

With this view as to the work before them, a portion of the committee first visited the orchards of Mr. C. Engle, near Paw Paw, in Van Buren county, on September 1. The location of these orchards is a point worthy of some study, and required more time than the committee found at their service. The orchards are upon high ground, or rather upon a hill, from which extended views of the east may be had. The surface of this hill is not flat nor regular, but varied with ridges or depressions, but with a general inclination rather to the east and south.

On the south and east, at the foot of the elevation, there is a broad belt, or stretch of low land, which gradually rises toward the east,—not abrupt enough anywhere to obstruct the free passage of wind currents which might in cold weather find here a passage or channel. The conformation of this intervale land is such that the cold air which would fall in here from its specific gravity is not liable to stagnate, but is easily and naturally drained off to the east or south. This peculiar formation prevents any body of very cold air from enveloping the orchards on the high ground. Wherever such a conformation of surface is found, the growing of fine fruit may be undertaken with a good assurance of success, so far as local climate is concerned.

It is believed that the more tender kinds of fruit should never be planted on the sides of a bluff or hill surrounding a lake, marsh, or gulch, where there is not a free outlet in at least two directions for the air to drain off readily. Those who have planted such fruits on the sides of elevations enclosing entirely a low plat of ground so that the air is hemmed in and there is no escape, are often disappointed in their expectations of a fine crop of fruit, we doubt not. The cold air accumulates and fills the basin, and the fruit-germs are for a long time immersed in it, till their vitality is destroyed. Tender fruit-germs cannot endure the constant presence of a cold, damp atmosphere any better than the roots of the trees or vines can stand the presence of surplus water.

THE ORCHARDS.

The orchards of peach, pear, and quince at Mr. Engle's were in full bearing. The work of gathering and boxing the fruit was in active progress among the Early Crawfords. The soil of these hills is a gravelly loam in which there is a good percentage of clay, so that we may term it a gravelly clay loam, rather than a gravelly sandy loam. It is a soil well adapted to the peach and the vine.

We first made an examination of a peach orchard of Early Crawfords and Barnards,—200 trees twelve years old. The trees branched at about four feet from the ground. They are uniform in size, and there has apparently been but few deaths since the orchard was planted. There were no signs of borer, no ruptured bark, no dead branches. The trees are healthy and are ripening a very full crop of peaches, which are very uniform as to size, and large enough. Mr. Engle practices cutting back about one-third of the last year's growth. He does this in February in warm weather, and for two reasons: it keeps the tops within bounds, and it saves thinning the fruit to a certain extent,—saving about one man's time in thinning. The health and vigor of this orchard, together with the heavy crop of fruit at the age of twelve years, evince the soundness of the treatment it receives. The other peach orchards, both of Hill's Chili and late Crawford, were in an equally healthy condition, and were carrying as much fruit as they could ripen well. The Barnards we judged would outbear the Crawfords. The committee were well pleased with everything in and about these peach orchards.

The pear orchard is located south of the twelve-year-old peach orchard, and embraces a large number of the popular kinds. But the old mystery is on many of them—blight! Fine, thrifty trees are poisoned by its fatal breath; yet there are some which escape. Bartlett is the most profitable; trees healthy and bear well. Beurre d'Anjou healthy,—bears good crops of the finest fruit. Doyenne Boussock nearly as good, but not quite so regular in bearing. Beurre

Diel good every way. Louise Bonne de Jersey and Duchesse are good as dwarfs. The Church bears regular, good crops of the best and handsomest fruit; healthy. Bloodgood bears well and sells high. Lawrence is very hardy, and yields good crops of first-rate fruit. Winter Nelis and Beurre Gris d'Hiver prove every way satisfactory as winter pears, and keep with as little trouble as apples. The Flemish Beauty blights 25 per cent; Vicar blights occasionally; Madaline and Onondaga blight 90 per cent here. A row of pears standing between two rows of peaches were not blighted at all, though they are the same varieties that are blighted in the orchard. Mr. Engle accounts for this on the supposition that the peach trees deprive the pears of a portion of the nourishment they would take up through the roots, resting this again on the theory that blight is caused by excessive absorption at the roots. The blight through the orchard came upon it after the entries had been made.

The orchard of quinces numbered 200 of fair-sized trees. They were healthy, and bearing very well indeed. This soil is not what is termed quince soil, as a heavy clay loam, well drained, suits it best, but Mr. Engle gets abundant and regular crops, and the fruit sells readily at good prices.

These trees began to bear at three years from setting. At eight years they yielded from one to three bushels per bush, which sell in Chicago or Detroit for \$2 a bushel.

About 200 bushes may be planted on an acre. These quince trees or bushes receive a handful of salt and a mulch of barn-yard manure annually.

The success of Mr. Engle with the various fruits ought to awaken a general interest in the growing of peaches, especially in this vicinity, and the committee learned with pleasure that at or near Lawton, in the same county, there are some excellent peach orchards and promising vineyards.

Battle Creek.

On the 22d of September three members of the committee, namely: H. Dale Adams, C. P. Avery, and Chas. Betts, recommenced work at Battle Creek. The Delaware vineyard entered here belonged to the Messrs. Chilson Brothers, and is situated on the "Marshall road," east of the town a mile or so. The situation of this vineyard and the condition of the vines, taken together, were a surprise to the committee. The vines are planted on low ground,—so low that most grape-growers would pronounce it unsuitable for the vine. The soil is a peculiar admixture of sand and some clay, but the sand partakes strongly of the nature of fine beach sand, such as is found along the southeastern shores of Lake Michigan. In some places the subsoil is clay, in others quicksand. But here are four acres of grapes in superb condition as to growth, health of vine, and bearing. The three acres of Delawares which occupy the lowest part of the ground are exceedingly thrifty, and heavily laden with fruit of large and uniform size. They are mostly grown to stakes three feet in height, through the top of which is inserted an inch pin twenty inches in length, which serves to attach the main branches of the vine to. The balance of the vines is trained upon a trellis two wires high. The fruit on the vines trained to stakes was plainly larger than that grown on the trellised vines.

What puzzled the committee exceedingly was to find vines so healthy and so loaded with fruit of good size and fine flavor, on a soil apparently, and according to our own ideas and notions respecting things of this sort, better adapted to the growing of red-top grass than to grape-vines of the tender sorts. There was no leaf-blight, no mildew. The cultivation consists of pruning in au-

tumn, laying the vines down in straight rows and back-furrowing toward them, leaving the ground in ridges, with the dead-furrows to receive the surface-water in the middle. In the spring the furrows are harrowed down and then reversed. The plow is not used again till the close of the season's operations.

When the vines are in full bearing, as they are this year, they are cultivated down to the latter part of August. It is believed that this late working helps materially to give size to the fruit, and where the vines are bearing to their full capacity, or nearly so, there is no danger to be apprehended from late wood growth, as the nourishment all goes to the fruit. The ground is kept level through the season of growth.

Adjoining the Delawares about an acre is planted with Concord, and with a few other varieties, among which are several of the Rogers Hybrids. Among these the 19 is preferred here, for its good size, color, bearing qualities, and healthfulness. No. 4 makes a good show.

Adjoining the vineyard is a half-acre of New Rochelle blackberries, which the past season yielded 1,400 quarts. The plants are bent down in the fall as a protection against winds.

On the morning of the 23d the committee visited a peach orchard on the farm of Mr. Charles Merritt, which was planted on a piece of ground surrounded by forests on all sides. Mr. Merritt could not accompany the committee, and their conclusions as to the advantages and disadvantages of such a location for a peach orchard were drawn solely from observation. The trees appeared to be sickly, and though not many years old, gave tokens of decrepitude and disease too plainly to be overlooked. There were borers at the collar and blight among the branches. It seemed like raising a colony of highly refined young people in the midst of a nation of barbarians, and the committee were not favorably impressed with the plan.

Kalamo.

At one o'clock on September 23d the committee left Battle Creek for Kalamo, Eaton county, to examine the entries made by Joseph Gridley. Mr. Gridley's orchard of 100 trees for profit consists of the common standard varieties, about thirty of which are here represented, mostly in bearing. The trees are healthy and vigorous, and are well cared for. The soil is nearly of first quality for apples, and it would be a wonder to find an orchard in poor condition on such land if it received any care at all. The committee gained no new or important facts from the examination of this orchard which will add value to this report. The young orchards, both of apple and peach, look remarkably promising, and have had excellent care so far.

The soil of Eaton county appears admirably adapted to apple-growing. The trees and the fruit which came within our observation confirm this view. The soil is a gravelly clay loam, and the surface quite rolling. Now and then a limestone was noticed along the roadside. These qualities indicate a good soil not only for apples, but for pears, plums, and quinces also.

Jackson—Mr. Knapp's Place.

Leaving Kalamo early on the morning of the 24th, we took the cars at Charlotte and reached Jackson a little before noon, and repaired at once to the residence of Mr. S. O. Knapp, who had entered "Suburban Grounds" and "Private Conservatory."

Mr. Knapp's place is within a few blocks of the business part of the city,

and the grounds are about six or eight acres in extent. The mansion stands on the highest portion, having a level plateau about it of several rods each way; then the surface slopes off gently to the north and east. This is not an extensive place which—

“ Wrapt all o’er in everlasting green,
Make one dull, vapid, smooth, and tranquil scene; ”

but the visitor gets an idea of extent by the diversity and succession of interesting objects. Greatness of dimension does not always produce greatness of character in a place. Greatness of character in garden scenery does not depend upon the length and breadth of the walks, but rather upon the variety, contrasts, and sometimes novelty of the objects introduced. No real improver wants his work estimated by the acre. The pleasure grounds near the dwelling may be considered as a part of the house itself, or rather as an intermediate apartment between the house and the less artistic portion,—a connecting link between the two.

In improving his place Mr. Knapp has, we think, proceeded very wisely and cautiously, and has therefore done nothing he or any one else wishes undone. With the true understanding of a lover of nature, he has preserved all the natural features of the place. No monotonous walk is chiseled out and graded and graveled, but the form of the ground is just as nature left it; and if you indulge in a walk you have nature’s carpet to walk upon. The native trees remain, and others have been added where it could be done to heighten the natural expression. Immediately about the house are numerous works of art,—rock work, fountains, vases, flower-beds, rare trees, and also some native boulders of rare formation. The beauty of the place, as we have already hinted, consists more in its naturalness than in its artistic adornments.

There are no walks except those which are necessary; no iron or marble lions or ugly dogs crouched beneath the trees, looking as if prepared and determined to spring upon the unsuspecting wayfarer; no deer, or antelope, no stone peasants or slave girls with rustic implements; simply grass, trees, plants, flowers, rocks, water. The place is inclosed on the north and west sides with a broad, low stone wall, surmounted by a wood paling, we think. The stone used in the fence were taken from these grounds mainly.

Mr. Knapp has avoided the mistake which many, if not most improvers run into—that of doing everything according to a certain system, becoming mere *mannerists*, making every natural thing, every natural feature, look like artificial ones. It affords us great pleasure to state that there is none of this studied mannerism here. There is congruity of parts; there is utility and order, without any sacrifice of natural beauty.

“ Blessed is the man in whose sequestered glade,
Some ancient abbey’s walls diffuse their shade;
With mould’ring windows pierced and turrets crowned,
And pinnacles with clinging ivy bound.”

But that mind must be insensible indeed, and barren of every sense of beauty and taste, which does not admire such simple scenes as these—even if the wood “glades,” the old “abbey walls,” and the “ivy-crowned turrets” are absent.

We now come to the conservatory or plant-house, the first merit of which is its exceeding cheapness of construction. In addition to this the cost of operating it is trifling. A very little fuel warms it, and it is easily reached from the living room of the house. It consists simply of an extension of the basement, or cellar, on a part of the east and south walls, affording a warm, sunny aspect

for the better part of the day. It is warmed by means of a fire-box made of brick, just in the main wall of the house at the bottom, with a flue connecting with the chimney, which reaches down to the basement. The front door was made at a foundry in the city. A small saddle boiler, made by Hitchings, with some gas-pipe procured at home, complete the heating apparatus. The roof is a lean-to, the upper ends of the rafters resting against the house. On the top of the outer wall, all around, there is a double-glazed sash about eighteen inches wide, and on the top of this sash rests the plate which receives the lower ends of the rafters.

Shelves for the plants are constructed around the outside, and also in the central portion of the house looking south. There is an out-door entrance which is used in warm weather.

The entire cost of this house, Mr. Knapp assured the committee, did not exceed \$350, and his chief object in entering the place was to gain the attention of amateur cultivators of plants and lovers of trees, and the quiet enjoyments of rural life, and correct a prevalent mistake among this class that these pure sources of pleasure and comfort are too expensive for anybody but those possessed of large wealth. Mr. Knapp has demonstrated here that the expense is not great, and thousands in the cities and villages, and throughout the country, may have these cheap houses, manage them themselves, and obtain from them more real enjoyment than from any other source requiring the same expense. Even cheaper plant-houses than this may be constructed, and prove a source of constant pleasure, instruction, and enjoyment to the family and to the neighborhood.

This house is filled with rare plants, among which are varieties of ferns, palms, caladiums, echeverias, alocacias, ceperonias, cannas, begonias, etc., etc., a list of which will be appended to the published report of the committee.

Mr. Knapp has succeeded in growing palms from seed without difficulty by soaking the seeds in warm water, then sowing on loose soil, and covering with sphagnum moss. They germinate with as much certainty as peas.

Your committee indulge the hope that the exemplary work of Mr. Knapp may find many imitators among our well-to-do citizens, both in town and country. Such places are constant teachers of the art of rural adornment and taste, and their influence in neighborhoods is wide and enduring.

At Adrian.

The committee reached Adrian on the 24th. There was one entry in the city, and one two miles out. The one in the city was the cold grapery and grounds of Mr. A. Sigler. It is but just to state that Mr. Sigler's object was not to gain praise or award, but to prove to persons of taste and to those desirous of having the finer fruits that they can have their reasonable wishes gratified at a very small expense indeed. Mr. Sigler has constructed a cheap grapery on the rear of his city lot, with glass on two sides, and a lean-to roof, with so little outlay of cash as to surprise most persons. And here we found growing Black Hamburg, Rose, and White Chasselas, White Muscat of Alexandria, White Tokay, Bowood Muscat, and many other varieties, about thirty in all. The White Tokay is worthless except for wine.

These vines afford an abundance of the finest fruit for home use a good part of the year, besides a large portion which finds its way to the tables of friends, and at a trifling cost.

This grapery was constructed with an eye to cheapness and effectiveness.

No needless expenditure, no trifling outlay is visible anywhere. It was built to demonstrate the fact that any one with a little knowledge of grape culture, or with the disposition to get knowledge, and with a little means and time, can have a cold-grapery and fine grapes. A lean-to like this may be erected against the south side of any outbuilding, or independent of any other building.

Every foot of ground on Mr. Sigler's lot is made to produce fruit of some sort. He has several varieties of pears, and early purple Guigne, Black Tartarian, and Black Eagle cherries.

The other entry at this point was two miles out. To reach this and get back to the city in time for the eight o'clock train to Monroe, required an early movement. Through the assiduity of Mr. Sigler and his wife two buggies were provided, and we were on the road by five. The gates of the morning opened as we rode toward its portals, and we reached our destination at an early hour, even for farmers. Here was an entry of a plum orchard and one of apples. The plum orchard consisted of sixteen bearing trees, which had yielded this season about ten bushels of fruit. The fruit sold in Adrian for \$5 a bushel. The curculio was destroyed by jarring down on sheets. This was begun as soon as the fruit was formed, and continued till no more were caught. The trees bore all they could sustain and mature. They are young. The soil is clay loam resting on clay, and is well adapted to plum and pear growing.

The apple orchard, consisting of about 400 trees, is beginning to bear. The chief varieties are Roxbury Russet, Greening, Northern Spy, Baldwin, Wagener, Red Canada, King of Tompkins County, Peck's Pleasant, Golden Russet, etc.,—too many varieties by half, probably. A majority of the committee are of the opinion that more money can be made with the Northern Spy alone than with so many varieties. Mr. Collier thought he would as soon trust the Baldwin as any variety. The Northern Spy, Red Canada, and Golden Russet were the only ones not injured by the cold. Many of the trees were found with the bark bursted on the southwest side of the trunk. Baldwin does well on Northern Spy and on Golden Russet stocks. The twig-borer attacks the Golden Russet invariably. Next to Baldwin, Mr. Collier gives preference to Rhode Island Greening; but here we found the bark bursted and the fruit falling badly. The committee conclude that all varieties liable to bark bursting should be grafted to hardy stocks either at standard height or in the tops.

Mr. Collier keeps his trees under culture; and they are pruned up so that teams may walk beneath the branches. There are some trees on this farm of forty years' planting, and are remarkable for size and health. We rode back to the city with spirits swimming in the brisk aura of a most delightful autumn morning, bid adieu to our kind host and hostess, and took the cars for the old town of Monroe.

At Monroe.

The entries at Monroe were the Monroe City Nurseries, owned by the Messrs. Ilgenfritz, the Point aux Peaux vineyards, and the vineyards of Henrietta and George W. Bruckner, located southeast of the city.

The committee were met by Mr. I. E. Ilgenfritz, and taken bodily to his residence on the banks of the River Raisin and cared for most generously and kindly during their pleasant stay. The Monroe City Nurseries cover nearly 300 acres, lying north and west of the city. The soil is mostly a heavy clay

loam, resting on clay and lime rock, which at various points crops out at the surface. Limestone is intermingled with the soil pretty freely. The ground on which these nurseries stand has been thoroughly underdrained with tile to a depth ranging from four to six feet. With a soil like this and in this condition none but healthy trees can be grown, unless the climate is too severe for some varieties. The committee were pleased to find very few unhealthy trees upon the whole 300 acres. It is a rule of this establishment to discard all trees not sound to the core. The committee were assured that in no case is a sickly or diseased tree sent to the patrons of this nursery, unless it escapes the careful examination of the proprietors. The committee take pleasure in expressing their belief that this honorable as well as prudent maxim is conscientiously adhered to. The immense blocks of trees are in rows as straight as a line can be drawn, are very uniform in size, stocky, well rooted, and straight.

On a portion of their grounds adjoining the depot of the Michigan Southern railroad, these gentlemen have erected large and commodious buildings for the reception of trees from the nurseries when dry, and for packing and boxing in during stormy weather. In the basement of one of these buildings a large portion is set apart as a place to heel trees in, to keep over winter. The other building is of stone, 50x100 feet, and is devoted exclusively to this purpose.

Peach trees which, if left in the ground all winter are often very seriously injured by the cold, or which if heeled in the open ground are not wholly free from injury, may be kept here as fresh as when taken up. Of course such trees will suit the planter much better than if they had been exposed to winds, sun, and storm all winter. Such keeping is a very good guarantee that they will grow.

The vineyard owned by Miss Henrietta Bruckner contains 1,000 Concord vines, and besides, some Delawares, Crevelings, and Hartfords. The Hartfords were gone, though we found a few dried and very sweet. The Crevelings were surprisingly fine, and delighted us by their sweet and pleasant flavor and aroma and their freedom from sour core.

The Concord vines were heavily loaded, and the fruit was of excellent quality and most thoroughly ripened. This vineyard receives very careful culture. Level culture is the rule—no ridging up the vine-rows. The thrip is very plentiful here, and some believe it injures the Delaware vine and fruit. From between fifty and seventy-five vines of the Delaware in this vineyard, 432 pounds of fruit were gathered. In one corner of this vineyard a small block of Marthas had been planted, but they had died out and out—not one left. The cause could not be ascertained. To look at the Catawbases, Delawares, Concorde, and Crevelings growing most vigorously and loaded with fruit, one would say that any vine would prosper here. The soil is the same clay loam, filled with broken limestone; surface nearly level. A short distance farther to the southeast is the Raisin Valley vineyard belonging to George W. Bruckner. It was planted in 1869, and covers eight acres. Root pruning has been tried here as an experiment, but with results not very well determined, though the system is regarded by the owner with some favor. The method pursued is to take off entire some of the upper roots—a practice which few fruit-growers would feel safe in adopting. We forgot to mention that the vines in the vineyard belonging to Henrietta Bruckner are trained to a wire trellis—large posts being placed at the ends of the rows, the wires drawn horizontally and supported by smaller posts. But in the vineyard here the vines are grown to stakes, which admits free working both ways. Stakes are thought to be cheaper than trellis. Some

portions of this vineyard are sandy, with clay subsoil, but the vines are more vigorous where the soil is clayey. The Delawares here are of prime quality.

We next visited a vineyard on Snake Island, owned by the same gentleman. This island lies a few rods from the main land, in an arm of the lake. We found a little *chaloupe* ready to take us across, and made our way through the grass and lilies which grow up quite thickly. The island is only a few feet above the water, and is surrounded by grassy borders. About this island a variety of the lotus grows quite plentifully, which is very rarely found in this country. It is the white flowering.

The island was called Snake Island, from its supposed resemblance in form to the renowned but ugly reptile of that name. It contains ten or twelve acres, of which four acres are in grapes and one acre in pears. The soil is a black loam resting on clay. No lime rock or stone of any kind appears here. The grapes are very sweet. Isabellas are ripe September 26th; Catawbas nearly so. The vines are trained to stakes, and they have made a most vigorous growth. The leaves are enormous in size, and for healthful appearance they are not equaled by any which the committee have seen in their examinations. Some of the Catawbas, received by members of the committee a week later than the date of their visit, were fully ripe, and were equal in color, flavor, and aroma to the Catawbas of Kelly's Island.

Before leaving the island an important occurrence took place, which, as a matter of history, may as well be recorded here. The name of the island was formally changed to "Bruckner's Lotos Island," by your committee and a few of the citizens and ladies of Monroe. There is no longer a Snake Island in Michigan, but there is a "Lotos Island," lying quietly in view of the city of Monroe in the still waters of an arm of Lake Erie, covered with fine fruit of vine and tree and surrounded by the fabled lotos of the Nile and of Cashmere.

Point aux Peaux.

A ride of an hour and a half brought us to this celebrated vineyard, which was thoroughly examined by the orchard committee of 1873. It lies near the mouth of Detroit river, and in sight of the pier at Monroe Harbor. The ground is level here and all about. In no place else can there be found so much quiet repose as nature exhibits in this shore belt from Toledo to Detroit. There is no sign of upheaval anywhere, or of the action of any violent forces beneath the surface. But the soil is strong and productive, and there is slant enough one way or another for drainage.

The Point aux Peaux vineyard is owned by Messrs. Stirling, Noble, Williams and Ives. There are twelve acres in vines; and they lie fronting the shore, with the buildings, a grass plat, and a drive between them and the water. In this grass fruit trees are growing—some very old, large peach trees in full vigor. In the spring of 1866, 900 each of Catawba, Delaware, and Concord vines were planted. The rows are the usual width apart, and the vines are grown on a horizontal trellis of wire put up in the usual way. The lower wire is twenty-two inches from the ground, the others are sixteen inches apart. The vines are penned after the leaves have fallen, and laid down, and the ground backfurrowed towards the rows. In the spring they are taken up and fastened to the lower wire. A short bend is given them at the point where they are first tied, which checks the rapid flow of sap, and aids the formation of fruit germs. No summer pruning is done at all; the vines are kept neatly tied to the trellis, and all the foliage is retained to assist in the perfection of the

fruit and better ripening of the wood. The furrows which in the fall were turned towards the vines are now reversed, and level culture is pursued. The vineyard and everything about it were in complete order.

The Delawares were mostly gone, 13,157 pounds having been sold from an acre and two-thirds. But this was not the whole crop, as the families of the four proprietors were supplied as well as others. Those sold brought six cents a pound. The Oporto grape has been tried and abandoned. Cultivation of the ground is kept up till the latter part of August. The thrip was everywhere on the vines, but caused no apparent injury except in one locality; and their presence here we could not explain. The drain from the wine-cellar runs across one portion of the vineyard, crossing the rows of vines for a length of six or eight rods. Directly over the line of this ditch the thrip were plentiful, and standing at a distance the course of the drain could be traced by the work of this insect.

From the vineyard we were shown into the press-room and wine-cellar. The establishment is well provided with all the needed appendages and apparatus for wine making and testing. There is a cleanliness about the place which is agreeable. The wood-work is painted; the floor is scrubbed daily during the wine-making season. As a general rule wine presses and cider presses are about as filthy places as can be found. Two presses are used here which work up the crop in a few days.

The wine-cellar is a large room only partly under ground, the level surface here and nearness to the water preventing deep cellars. It is filled with pipes and casks of wine of different ages. These pipes hold from 105 to 140 gallons, and are as high as the shoulders of a common-sized man. Samples of the wine were drawn from the different receptacles for the committee to examine.

These wines are all pure,—there are no adulterations, though wine of different qualities is made and sold at different prices.

AMONG THE ORCHARDS AND VINE- YARDS OF MICHIGAN.

BY H. DALE ADAMS OF GALESBURG.

THE ENGLE ORCHARDS.

On the first day of September, 1874, at Columbus Engle's, near Paw Paw, in Van Buren county, the work of the Orchard Committee began. Mr. Engle had four entries for examination; two peach orchards, one pear, and one quince. Leaving the Michigan Central railroad at Lawton, through the kindness of Mr. F. M. Manning, superintendent of the Paw Paw road, we were dropped at the Engle crossing a few rods from the farm dwelling. The first notable object that met our eye on stepping from the car was the Willard Observatory on the grounds of the Paw Paw cemetery, occupying the highest point in the cemetery grounds, and erected by Isaac Willard, an early settler of that locality. It is an octagon shaft, thirty feet in diameter at the base, and one hundred and thirty-two feet in height to the cupola, and built on an eminence nearly, if not the highest, in Van Buren county, it commands a view of the surrounding country as far as the eye can reach. I speak of this only because it is at this place, and at an elevation co-equal, that the Engle orchards are to be found, and from this observatory Mr. Engle informed us he could point out nearly all the locations suitable for orchard purposes for many miles around.

The peach orchard in class 8 was first examined, and here we found Mr. Engle in the midst of his luscious Crawfords, picking at the rate of 400 boxes of one-third of a bushel each per day. The location of these orchards deserves more than a passing notice, and consists of a series of hills or knolls, mostly of only a few acres in extent, with deep valleys intervening, and leading in the direction of every point of the compass. Only the higher positions were occupied with the peach. The valleys and most of the hills near the base were planted to the apple, the pear, and the quince. The soil is what would be termed a gravelly loam, with sufficient clay to give it substance and not enough to interfere with perfect drainage. In the opinion of the committee no soil can be found better adapted to the peach than the soil of these orchards. The first orchard consisted of 900 trees planted twelve years, and about equally divided between Early Crawfords and the Barnard. Thorough cultivation has its reward here—not a weed to be seen, the whole orchard as mellow as the best of fallow prepared for a wheat crop. Shallow plowing in the spring and afterwards the two-horse wheel cultivator has done the work. Three times each

way between the rows of trees have these orchards been over with the cultivator this season ; the last time on July 15th.

Severe cutting back of the trees, commencing as soon as warm weather will permit in the spring, is one of the marked features in the management of these peach orchards, and to it the owner attributes much of the thriftiness and vigor of the trees as well as the size and quality of the fruit. Thinning the fruit also is thoroughly practiced. Three times have these trees been thinned of their overburthened loads of fruit this season. One man will average fifty trees per day if cut back. The curculio is the worst of all the insect depredators, and is caught by the jarring process, on canvass stretchers attached to a barrow, and wheeled from tree to tree. The borer, so fatal to the growing of the peach in many localities, has no lodgment here ; a diligent search by Mr. Sleeper, the entomologist of the committee, failed to find their presence anywhere.

The next orchard examined was entered in Class 9, Division A, and contained 200 trees, planted four years, two varieties only, Jenny Lind (Hill's Chili) and Late Crawford, about 100 each. These plants are all seedlings, or grown from pits, and Mr. Engle claims they are as true to name and more so than most trees bought of nurserymen as budded trees. The Jenny Lind are almost invariably true to variety grown in this way. The Crawfords vary some, but those not genuine are easily detected in the seedling row. We failed to discover any variation among the varieties named in this orchard. Should have pronounced them budded trees and true to name. This, like the orchard first named, was heavily laden with fruit, which had already begun to color finely. Altogether this was, without exception, the finest 200 peach-trees found in any one orchard visited by your committee in their examinations. Like the one first mentioned, it secured a first premium. A subsequent visit, on the 21st of October, after the examination of the other orchards had been completed, and when the fruit had long since been gathered, fully confirmed the decisions already made. Five thousand five hundred boxes of one-third bushel each were gathered and sold from these two orchards this year, bringing an average of 76 cents net per box, and found a market mostly on the line of the M. C. R. R. east of Lawton, Detroit and Jackson taking the most.

A few pertinent questions elicited the following replies:

1. To what do you attribute the thriftiness and vigor of your trees ? Ans. Thorough cultivation and severe cutting back.

2. What is your theory of protection ? Ans. The wind currents, in passing over this section, are caught in the valleys and drift rapidly off, following their courses, the colder portion settling along the bottoms, leaving the warmer to drift over the more elevated plain.

3. What is your most profitable variety ? Ans. Jenny Lind (or Hill's Chili), and Late Crawford next. Old Mixon is a good peach, but too soft for market.

4. Are you troubled with birds injuring any of your fruit crops ? Ans. Yes, especially small fruits ; cherries the worst.

5. What remedy do you apply ? Ans. Kill them. I have no more hesitancy in killing a bird for the same reason than a curculio, the laws of the State to the contrary notwithstanding.

The pear orchard in class No. 6 has no competitors. A heavy wind a short time previous to our visit destroyed one-half the fruit, but still left enough for an average crop, perhaps more. Among a large number of varieties found, which were especially fine, were Bartlett and Buffum. A variety called the Church

resembles the Doyenne d'Ete, and I think may be found identical, was also in great perfection. The blight has proved fatal to many of the fine specimens of this enterprising cultivator. The Onondagas were all ruined. The Flemish Beauty, Louise Bonne de Jersey and Bartlett were slightly injured. Winter Nelis, Duchesse, and many other sorts were found in a deplorable condition. The Bartlett thus far was named as the most profitable variety and the Buffum next.

An exceedingly fine row of pear trees of large size, and free from blight or injury of any kind, was noticed growing between rows of peach trees, and loaded heavily with choice specimens of fruit, mostly Bartlett and Flemish Beauty. On inquiry as to their fine condition, while within a stone's throw of the same varieties so badly injured, we were told it was in the condition of the soil.

The peach being a gross feeder appropriated nearly all the crude vegetable manures with which his orchards had been liberally supplied, and he had found where this class of manures had been applied to the pear in greatest quantity, they had suffered most from blight. There were about forty trees in this row, mostly Bartlett, and finer specimens of fruit are seldom found than were burthening the branches of these beautiful trees. The location, soil, cultivation, etc., of this orchard, and also of the quince, which was next examined, were the same as the older peach orchard, of which it was an adjoining plat.

The quince trees were planted in cross sections of the apple orchard, and equally dividing it from north to south and from east to west, and was thus planted to test the adaptability of the varied soil to the growth of the quince, of which Mr. Engle had had no former experience. The trees encountered nearly every variety of soil, from heavy clay to sand and gravel, but no perceptible difference was discovered in the growth, health, or productiveness of the trees. The only injury manifested as yet was by the twig-burr in the early part of the season, and that not material. How unlike the pear trees only a few well distant, and heavily ruined by the blight! A beautiful crop of fine quinces rewards the owner for his labors here.

THE GARDENS AT SAGINAW.

The Saginaw Valley furnished but two entries in Division A. Both were in class 34, "Fruit garden attached to village or city residence, to include a succession." The first was by John C. Zeigler, and the next by E. F. Guild. On examination, neither seemed to properly belong to this class. Mr. Guild's was the nearest approach to it, and was left in to compete with Dr. T. J. Hutchinson of Northport, Leelanaw county, and Mr. Zeigler's entry was transferred to class 20, in competition with Thomas Doyle of Monroe. Mr. Guild's garden was examined on September 16, during the State Fair, and found to comprise what would be better termed a family garden than a fruit garden.

Everything here was found in neat order; all the ground utilized to the fullest capacity, both in regard to profit for family use and attractive beauty to the household; vegetables in their season, with successive crops of peas, beans, corn, lettuce, cabbage, etc.; small fruit in abundance, strawberries in variety, raspberries of several sorts, with evidence of having borne heavy crops, of which were found several magnificent clusters of a second crop, blackberries, currants, and gooseberries, with a few cherries and peaches just coming in bearing, make up the list of fruits in this small garden. Passing from the useful to the beautiful, were found flowers on every hand,—annuals, perennials, bulbous, and tuberous-rooted, in-doors and out, flowers everywhere.

Several wardian cases of the owner's own make, well filled with rare exotics of his own growing, were adorning the parlor windows, and still more, there was found room on one side of the dwelling sufficient to attach a small conservatory, which this enthusiast was busy erecting for winter use, and all included within the limits of an ordinary village lot of perhaps eight by twelve rods in dimensions.

From Mr. Guild's, in East Saginaw, to J. C. Zeigler's, Saginaw City, was our next move. This garden was all occupied with hardy grapes, planted and trellised in squares, each square or plat containing eight vines, or three on a side including the corner ones, which were trellised at either angle, the distance apart, from vine to vine, being six feet, making the plats each twelve feet square, and these squares separated by alleys six feet wide, an economical and convenient plan for garden culture. The varieties in cultivation here were Concord, Catawba (which is too far north to ripen well), Isabella, Clinton, and a variety purchased of an Eastern vender for Israella at \$1 per plant, which proved in the hands of the committee to be Isabella. Three-fourths of these vines at Mr. Zeigler's were Clintons, and grown expressly for making a sour wine suitable to the German taste, samples of which were tested by the entire committee and found fully up to the standard of this class of wines. Nothing special in the cultivation or management in general from ordinary culture was manifested here. Mr. Zeigler would do well, however, to adopt a more vigorous system of pruning on the renewal plan.

CHILSON'S VINEYARDS.

September 22d was agreed upon to complete the examination of the eastern and southern portions of the State, and the vineyards of the Messrs. Chilsons of Battle Creek were taken as the starting point. In company with Mr. Avery we were joined at Galesburg by the chairman of our committee, Mr. Betts. The Messrs. Chilson had entered a vineyard for profit in class 17, four years planted and not less than one acre. In this vineyard were 2,900 vines planted five years, eight by ten feet apart, on a somewhat sandy soil underlaid with clay from one to two feet from the surface. The cultivation is very perfect, and performed by plowing first in early spring, and afterwards through the season with the two-horse wheel cultivator as often as once in ten or twelve days up to the first of September. The location is flat, nearly level, slightly descending to the north, about twenty feet above the Kalamazoo river, and distant one-half mile. The varieties were in the main Delaware and Concord, a few Isabellas, some Dianas, which were found in greater perfection here than elsewhere in our travels. They have also on trial several of the Hybrids, such as Rogers' Nos. 4, 15, 19, 14, 22, etc. Nos. 4 and 16 (Wilder and Agawam) were notably the best on the list thus far; but side by side with the Delaware and Concord they hold no favorable comparison. About one-half of the 2,900 vines were Delawares, part trained to wire trellises and balance to stakes. They use but two wires; they should have added another and run the canes higher. In pruning they practice the renewal system, or, as it is frequently termed, the long cane system. It appeared here best applied to the Concord. The vines when set were very feeble plants, and an unfavorable season caused many failures in the plat; the places have been filled since, causing an uneven and somewhat unfavorable appearance, many of the vines not yet in full bearing, but enough were to stamp this vineyard, for this season at least, the most productive as well as profitable of any in its class. Nowhere have we

found the Delaware in such perfection as at this place. Thousands of pounds of premium bunches could have been gathered from these vines at the time of my first visit, September 9th, and enough were remaining on the 22d to satisfy your committee that this vineyard would be hard to excel. Their picking and marketing commenced on September 7th. The city of Battle Creek furnished a ready market for their entire crop at ten cents per pound for Delawares, and five cents for Concords. It is worthy of note here to mention the manner of preparing and sending this fruit to market. They were marketed in the common peach basket, and great care exercised in picking and handling before taken to the assorting and packing house, then every bunch looked over and all imperfect berries removed before the final packing, each basket weighed to make sure that the full ten pounds were in. Three tons of Delawares and one-half as many of other varieties was the product of this season.

AT BATTLE CREEK.

We filled an interval of time by visiting several places of interest to horticulture. Through the kindness of Mr. C. Chilson we were first shown to the fruit farm of Jos. Merritt. The main object was to examine a peach orchard which has suffered to a greater extent by the severe winter of two years ago than any other in that locality. The trees were largely Early Crawford and planted about eight years. Mr. Merritt prepared about four acres by clearing out the center of a forty-acre forest of second growth oak and hickory, very dense and tall; all the surroundings indicate as good a situation for the peach as can be desired. Now for the result: Nearly one-half the trees were killed outright, and the balance so nearly so that after the severe cutting in of the branches the following spring and the excellent care in other respects, by cultivation, etc., of the proprietor, they must be counted to-day as nearly worthless. Compare this orchard, surrounded by forest protection, with the Engle orchards so fully exposed, and the theory of forest protection falls at once. We then drove to the fruit preserving establishment of Helling Brothers. They are extensive fruit dealers in Philadelphia, and are erecting this building for preserving fruit in a green state for the market at any season of the year. The walls are of solid masonry, 30 inches thick. The building is 120 feet long by 50 feet wide, 12 feet in height, clear, for store-room, covered with an iron floor above for ice chambers; its capacity is 10,000 barrels of fruit. The Hellings have for many years noticed the excellent quality of our fruits, and an investment of \$30,000 in an establishment of this character speaks loudly in favor of Michigan as a fruit-growing State. Near this establishment were the cider works of Walter S. Hicks, which we found in full blast, three ten-barrel presses of Boomer & Boscher patent in operation, two of which were used for cider and one for pressing over the pomace for vinegar. The large grinder works up 200 bushels of apples per hour. The cider is all double rectified, and the machinery is driven by a ten-horse-power engine.

From the cider works we drove to the River Side rural home of Jeremiah Brown. Found Mr. Brown absent in the city on our arrival, but the absence of his genial countenance was in a measure made up by the kind reception we met with at the hands of his amiable niece, Miss Sarah Hoeteling, who gave us full permission to ramble throughout the entire grounds. We found many things at this place worthy of notice at greater length than we are permitted to give at this time, hoping at some future time we may be able to give an account more worthy of the place. An excellent plat of the Philadelphia rasp-

berry showed the masterly hand of a successful horticulturist, nor were the pear, the peach, or apple orchards lacking in the essentials requisite to ensure success. The flower garden was a gem in itself, as might have been expected in the careful hands of such a passionate admirer as Mrs. Brown, whom we regretted to find absent. Mr. Brown returned in time to spread before us the hospitable board of cake and wine, for which his house has ever been noted, and we spent a few moments in horticultural converse.

From Chilson's our route was to Bellevue by rail and eight miles due north by wagon to Joseph Gridley's in Kalama, Eaton county. Mr. Gridley had three orchards on the list, one planted ten or more years, of twenty-five or more trees, and a peach orchard in class 10. These were the orchards entered last year, and nothing particularly new or interesting beyond the report of the committee at that time seems to have been developed since. Mr. Gridley acknowledged to have been mistaken in the Ben Davis apple, of which he gave the public an account through the horticultural press some time since,—the variety not proving to be the Ben Davis. An early start in the morning and a ride through a rolling country of timbered soil which must ere long be planted largely to orchards, and especially the apple, for which this section of country is most surely adapted, brought us to Charlotte, the county seat of Eaton county, in time for the Jackson bound train over the Grand River Valley Railroad, reaching Jackson at 11 A. M.

THE COMMITTEE AT JACKSON.—GROUNDS AND HOUSES OF S. O. KNAPP.

A walk of a few minutes brought us to the fine residence and magnificent grounds of S. O. Knapp, Esq., who had an entry in class 33, "Suburban Ornamental Grounds," and in class 38, "Collection of Growing Hardy Flowering Plants," and one in class 39, "Private Plant House." These charming grounds were found to comprise about five acres, occupying an elevated and commanding position in the south-east portion of the city. They are enclosed on two sides by a wall of solid masonry over sixty-five rods in extent, and elevated above the street about five feet, the enclosed grounds being level with the top of the wall and caused by grading down the street. You enter the grounds by an iron gate, and up a flight of stone steps. The first attraction on entering these grounds on that dry, hot, and dusty September day, were several fountains in full play. They are supplied with water by the Holly water-works of the city, which have been indispensable to the luxuriant growth and unsurpassing verdure of the trees and plants throughout this season of excessive drouth. We were met at the door by Mr. Knapp, and stated to him that our time was limited, as we desired to reach Adrian that evening. We were first shown the plant houses (there are properly two) attached to the dwelling, and sunken below the surface sufficient to bring the bottom on a level with the house cellar, with which they communicate by doors opening into a small room partitioned from the main cellar. This room is used for potting plants, storing mould, sand, and tools used in the management of the house and plants. A quantity of the finest leaf mould and sand was noticed stored here in bins, ready for use at any moment. The houses occupy the south and east sides of the dwelling, the one on the south lapping by sufficient to cover the end of the other. A ventilating shutter connects the two at this point. They are single span or lean-to roofs, about 400 feet of glass in all, double-glazed. The heating apparatus is Hitching's saddle boiler, of small size. The whole structure, heating apparatus and all complete, cost not more than \$400. The houses

were both filled and arranged in the finest order for pleasing effect, and many of the rarest exotics were here found in the greatest perfection. Among the specimens noticed were a fine collection of palms, many of them grown from seed by the skillful proprietor, who, by the way, is at once architect, gardener, and florist combined. None of the plants have had the care for a day of a professional florist. There were Euphorbias, *Splendens* and *Jacquiniflora*, Hoyas, ten varieties of Caladiums, Cyperus, etc. Several fine orchids were hanging from the walls. Tree Ferns in variety. Two fine specimens of *Feronia*, *Gigantea* and *Verschaffeltii*, Olocaceas, Macrohibra, and Zebrina, Pepperonias, Bananas. I also noticed a fine plant of *Cissus*. Among the Ferns, two fine specimens, *Asplenium* and *Alatum*, were particularly attractive. There were also Crotons in variety; Pancratums, Aspidistras, Vincas, Cupheas, Tradescantias, etc., in variety too great to be mentioned here; in fact, but few of our largest commercial plant-houses can boast of a greater variety or rarer specimens of exotic plants than were found in these unpretending, cozy little plant houses of S. O. Knapp of Jackson. Many persons of comparatively large incomes have neglected adding these luxuries to their surroundings, in consequence of the great expense supposed to be necessary to put and maintain them on a scale with the other requisites of a well-ordered establishment. Most people, should they consult an architect for plan of house, would hardly get through with him with less perhaps than one or two thousand dollars for building, and then the gardener would be likely to add as much more, and before they would be through with these professional gentlemen they would find themselves dancing to no trifling music in the matter of dollars and cents expended. But here is a gentleman who has demonstrated that all these interesting and beautiful adornments may be had on a scale grand enough to satisfy the most fastidious, for the outlay of only a few hundred dollars. I doubt very much if these two tasty houses, with appurtenances and care of the same to the present time, have cost the owner in dollars and cents to exceed the sum of \$400. The suburban grounds were no less interesting; enough of the native trees—which were mostly oak and hickory—were left remaining to give the grounds a decidedly park-like appearance. Many ornamental trees and shrubs have been added from time to time as taste and variety seemed to require to make up the finish. Among them were noticed the common sweet and horse chestnuts, with evergreens in great variety. A beautiful grotto of rock-work, wherein was playing an elegant fountain, of unique design was especially conspicuous. Curious vases, and plant stands of pottery of rare design, filled with appropriate plants, were interspersed throughout the ground—all combining to make up the design in full, and render this charming place, without an exception, the most delightful “abiding place for man” that our beautiful Peninsular State can boast. Nothing is lacking here but the charming scenery and distant landscape, so often met with among the highlands of the Hudson, to render this place equally attractive to the beholder. Indeed, to a person long familiar, as the writer has been, with many of those charming retreats, he could not help but recognize a striking resemblance.

Apart, and enclosed by a neatly trimmed arbor vitæ hedge, was found a grand display of hardy flowering plants. In looking over this gorgeous collection one would be led to conclude that Vick and Henderson and Briggs and Bliss had chosen this for a tilting ground for the smiles of the goddess Flora, and each proclaimed a victor without even stain upon their knightly escutcheons. But “*tempus fugit*,” we are admonished. No more time can be spared here,

and we hie with rapid footsteps to the southern-bound train, ever and anon casting a look behind toward the graceful scenery we were permitted no longer to behold.

AT ADRIAN.—SIGLER'S GRAPE HOUSE.

On arriving at Adrian we were met at the depot by Dr. D. K. Underwood, a member of our committee who escorted us to his residence. On our way we stopped to see the Concord grape vine of Mr. Bury, that was fruiting amber colored fox grapes, an account of which has been the rounds of the agricultural press. We found the grapes, as the doctor informed us, *fox* grapes, resembling the old Connecticut fox grape. This is evidently a grafted vine—the Concord cane, or graft, dying, and the vine sprouting again below the graft. There are numberless cases of this kind happening every season. I have a like case on my own grounds; but these Adrian people will have it that through some freak of nature this Concord vine has gone to bearing fox grapes. We decline to discuss the matter, and so let it end; perhaps another season this foolish vine may behave better, and again produce Concord, or some variety better still.

Mr. A. Sigler of this city had entered a fruit garden in class 34, which proved on examination to consist almost entirely of foreign grapes grown under glass. It did not seem appropriately to belong to this class. It was transferred and made a special class—No. 35. Mr. Sigler has been remarkably successful in the growing of foreign grapes. He is a jeweler, and has an extensive business,—the largest establishment of the kind, I believe, in the city,—and from the leisure hours spared from this business has built, with his own hands, about 1,200 square feet of glass, prepared the border, and planted, trained, and attended personally to the entire management of the vines from first to last. Thirty-four varieties of foreign, with a few natives for experiment, were enclosed in this graperly. Nearly all the most popular of the older varieties were in the collection, with many of the newer sorts. At the head of the list stands that indispensable variety, even to the smallest collection, the Black Hamburg, followed by Wilmot's Black Hamburg, White Hamburg, White Nice, Rose Chasselas, White Muscat of Alexandria, Black Prince, Black St. Peters, Barbarossa, Bowood, Muscat, etc. The newer sorts noticed were Duc de Magenta, Lady Downes, Mrs. Prince's Muscat, Trentham Black, Alicante, Champion Hamburg, etc. Of the native varieties none bore evidence of success under the close confinement of house culture, and their places should be filled with the better of the foreign sorts. In the way of management, no portion of this house was arranged to pursue the forcing plan. It is what would be termed a cold graperly. There are too many varieties, and I advise Mr. Sigler to throw at least half of them out, and two-thirds would be better still—one Black Hamburg is of more value than ten White Hamburgs, or an equal number of White Nice, and so of many other varieties besides. Mr. Sigler was, however, experimenting with a plan of heating by a subterranean furnace, with a view of using a part of the house for forcing, the result of which has not as yet been fully determined. Hundreds of pounds of fine clusters, some of prodigious size, were still on the vines, and your committee availed themselves of the profuse generosity of the proprietor in testing their merits, until I noticed—well—that our chairman (Brother Betts is an ardent lover of grapes) began to assume aldermanic proportions. But little trouble has been met with here, under the watchful eye

of the manager, with the mildew, so fatal to the successful cultivation of foreign varieties in this country. The timely use of sulphur dusted over the vines showing the least indications of the disease is found sufficient. The cost of this entire grapery, I am told, has not exceeded \$300, and were the proprietor to strike a balance between the market value of the fruit and the cost of production there would be found a margin largely in favor of the investment. But few are marketed,—the large-hearted proprietor preferring to please the taste of his numerous friends to the profits of sale. Mr. Sigler might greatly increase the products by growing a number of vines in pots which could be accommodated in his house without inconvenience. He has set a worthy example to those living in crowded villages and cities, and whose grounds are necessarily confined to narrow limits. Verily he has his reward, and may he have many followers.

COLLAR'S ORCHARDS.

From Sigler's we were driven out some three miles to view the plum and apple orchards of Peter Collar,—Betts and Avery were obliged to accept a seat with Sigler (through whose kindness in furnishing us with elegant conveniences and pleasant company we are greatly indebted), while we were invited to the side of his most charming wife,—who draws a rein with no less dextrous hand,—nor is she, by the way, less devoted or enthusiastic in matters pertaining to horticulture and floriculture than her generous and admiring spouse. At Peter Collar's we found 18 trees in the plum orchard, planted four years, all of one variety, the Imperial Gage. The site of the orchard was a slight elevation or knoll; soil gravelly; trees appeared to have borne a heavy crop; they were healthy and of thrifty growth. No other means than the jarring process for catching the curculio has been practiced. A little less than one bushel per tree was the average crop this season, and the price obtained in market was \$5 per bushel.

From the plum to the apple orchard, entered in our committee book, our pathway led through an apple orchard set 35 years; many of the trees were of mammoth size,—our curiosity led us to measure the trunks of some of them. Several were found six feet in circumference, sound and vigorous still,—this was not entered. The one entered in class 2 was found in many respects defective. First, the location was too low, land too level, soil heavy clay; then, again, the trees were headed too high,—most of them six or seven feet to the branches. A good selection of varieties was a redeeming feature,—Baldwin, Greening, Northern Spy, Golden Russet, Wagener, Peck's Pleasant, etc. Most of the Baldwins were grafted on the Golden Russet. The orchard had been planted eight years, and suffered greatly by the winter two years ago. The borers were lively at work in many of the injured trees, especially in those of the less hardy sorts, such as Baldwin, Greening, and Wagener. One row, the entire length of the orchard, of the Northern Spy, were a superb lot of trees,—not one missing or injured,—of large size, trunks six inches in diameter. A fair estimate would put the orchard at \$1,000 more value had they been all of this variety. An adjoining row on one side were the Wagener, not one-half the size, and many of them badly injured and really worthless. This orchard, in common with many others in different parts of the State, had suffered by the twig borer. The orchard was in corn and well tended, and had made a fair growth.

We were back again at Adrian in time for the 8 A. M. train for Monroe.

Dr. Underwood was too ill to accompany us. A sandwich and a cup of coffee sufficed for a breakfast, and aboard the train for Monroe, where we arrived in time for a substantial dinner at the hospitable mansion of I. E. Ilgenfritz, who is the nursery king of the State.

THE MONROE NURSERIES.

The Messrs. Ilgenfritz had entered a general nursery in class 41. Directly in front and adjoining the Michigan Southern railroad depot are the extensive packing houses and ornamental grounds of this establishment. A description of the buildings and grounds may not be inappropriate here: The main packing house is 40 by 156 feet, two stories high, with cellar for heeling in such trees and plants as are required for spring sales and would be likely to take injury through the winter if left in the open ground; another advantage is, it facilitates early shipments in spring. This cellar extends under the entire building, and is entered at either end by doorways of sufficient size to admit of team and wagon loaded with trees. The bottom is laid with a coat of cement four inches thick, and this again covered eighteen inches deep with fine soil for laying in the roots of trees and plants. Here thousands of trees and plants can be safely stored out of all danger of injury from wind and weather, ready for shipment a month or more before any can be moved from the open ground. In fact, at any time during the winter months, should mild weather occur, they can be handled with safety from these cellars. The ground floor is used for boxing, marking, etc., and affords ample room for thirty or forty men to work. On one end of this floor are the business offices, and underneath the grafting room. The upper story is used for manufacturing and storing boxes used in packing trees, and for the storing of tools, etc. So indispensable to their extensive business have the proprietors found the heeling cellar above mentioned, that they were erecting, and had nearly completed another building 50x100 feet, with walls of masonry fourteen feet high, and set in the ground six feet, to be used exclusively for this purpose. It is connected with the main building by an open shed, 40x100 feet. This is used for a packing shed and for storing moss, etc. The ornamental grounds attached to these buildings are nine acres in extent, and were made up of city lots covered with dwellings, which the Messrs. Ilgenfritz have purchased and torn down or removed, until they have the present area all to themselves, and situated in one of the most advantageous and pleasant parts of the city. The grounds were somewhat low in their natural state, and the proprietors have been at great expense in filling and leveling. They have covered several acres with fine soil for the growth of ornamental plants to the depth of from two to six feet. It was a vast labor, but Mr. Ilgenfritz remarked: "The soil should be laid on until it pleased him, if it required a depth of ten feet." There is "a heap of vim" in this man, I. E. Ilgenfritz. These grounds were in part already planted to the finest varieties of ornamental flowering plants and shrubs, and the coming season they will be entirely filled. From the ornamental grounds we accompanied the proprietors to the farms where the heavy stocks of fruit and ornamental trees are grown. There are three in all, covering upwards of 300 acres in extent. And such stocks of trees were wonderful. The quantities of special leading varieties—50,000 Baldwin, 50,000 Greening, 20,000 and 30,000 Spy, Canada, etc.,—were no unusual quantities to be found in single blocks.

The soil where these nurseries are located is a rich alluvial, underlaid with clay, covering the limestone formation at most but a few feet below the sur-

face, and cropping out in numerous places. The cultivation was the nearest perfection to be met with anywhere. I much doubt if throughout the whole extent of these grounds a barrow load of weeds could have been gathered. All the grounds are underdrained. Mr. Ilgenfritz informed us not a rood of ground was used for nursery purposes without first being thoroughly tiled, the cost of which varies from \$40 to \$60 per acre. In the way of the newer varieties of fruit tree stock, these men were found no way behind their eastern and western competitors. Among the apples were Grimes' Golden and American Beauty in large quantities, and many other novelties, I was surprised to find in such quantities. This seems to be the soil for growing the pear; finer specimens, of all ages from one to three and four years old, can be found nowhere in the State; nor have I ever seen finer blocks of pear trees at Rochester, Geneva, or Syracuse, and the quantity fully up to the demand. The cherry and peach are not so heavily grown; but the proprietors have a keen eye to the prospective demand and plant in proportion. And yet one important branch of this extensive establishment was hardly up to the demand of the times; I refer to the ornamental department. They should have some glass houses, a propagating house, a specimen plant house, etc., and now that they are finally established on their newly acquired, and long coveted, grounds, they should be added at once. Preparations were already being made for their erection, and early in the coming season will find them completed. The increasing demand for hardy evergreens must require a much larger stock than were noticed here, and on inquiry we were informed that they were preparing for a heavy stock in this department the coming season. Their one and two-years-old grape vines were particularly fine; one block of 11,000 Concord, this season's cuttings, were extra. But in the immense stocks of the apple, their fine growth and healthy condition, the uniformity of size and form of tree, the neatness and order of planting, with rows as straight as lines of light, and extending in some blocks for a mile or more in length, are found an abundant source of meritorious praise. Some idea of the magnitude of this establishment may be gained by referring to the amount of stocks planted during the past three years. On referring to the registry for 1871 the planting for that year footed to upwards of 600,000. In 1872 their setting reached 650,000. These two lots were cut to the ground in the spring of 1873. They are a magnificent lot of trees now, and ready for market, standing from five to seven feet high, well branched, and as desirable a lot to select from as one would wish. In 1873 400,000 were planted. Again in 1874, 400,000 more. The fall of 1875 and spring of 1876 will find this establishment in possession of nearly one million trees ready for market. Tree planters of Michigan! give these gentlemen a trial; they are worthy of your patronage, and your own interests will be served by so doing. They have had their share in the disasters of the unprecedented cold winter of 1872 and 1873; the loss was very great. After becoming convinced of the damage done, they resolved to destroy all that were known to be injured, and upwards of \$20,000 worth were committed to the flames.

Mr. John C. Greening has a nursery southeast of the city, entered in the same class as Messrs. Ilgenfritz. This is a new establishment, commenced three years ago. Most of the stock were in good condition and doing finely, but the drouth had told heavily on much of the stock planted this season. An extra fine block of two-year-old pear trees were noticed, and several thousand grape vines, one and two year's cuttings, were especially so. One block of

five acres of this season's setting of root grafts was not excelled by any yet examined. A Concord vineyard of two and a half acres attached to the nursery, and another of five acres adjoining, and loaded with luscious clusters of grapes, were timely approached by your committee.

The nursery establishment of Reynolds, Lewis & Co., although not entered on our books, must not be forgotten, nor be passed over without a word in its favor. This establishment is next to the Messrs. Ilgenfritz's in size, and much of it adjoining, with nothing, apparently, to mark the dividing line; and one had to be told when they were leaving the one and trespassing on the other. Notwithstanding the committee gave it no formal examination, enough could be seen to warrant us in saying that, in most respects, it was fully up to the demands of the times. Any persons visiting Monroe in quest of fruit trees would hardly fail, among three such establishments as those mentioned, to find a supply to their satisfaction.

THE ORCHARDS AND VINEYARDS OF MONROE.

The vineyards of Monroe cover upwards of 200 acres. The first planted was by Joseph M. Sterling in 1863, and it consisted of 2,050 vines, mostly Concord. It stands to-day among the best in the Raisin Valley. The late Christopher Bruckner next planted about 300 vines in 1864, and from the success of these beginnings many others have been induced from time to time to embark in the business until it has reached its present magnitude, and bids fair to be doubled and perhaps quadrupled within the next five years at least. There were six vineyards on the committee book, and entered in five different classes. The soil of these vineyards, like that of the Ilgenfritz nurseries, is a rich alluvial, with heavy clay subsoil, underlaid with the limestone rock at a variable depth of from one to five feet. I think none of the vineyards examined were an exception in this respect. The management throughout, from the planting of the vine, the after culture, the varieties planted, to the disposition of the fruit, seems to be nearly the same among all these vineyards, and what may be said of one may appropriately apply to the rest, with few and slight exceptions. They are planted eight feet apart each way, and trained to wire trellis, using three wires stretched from heavy posts set thirty feet apart and subdivided into sections by cross alleys 300 feet distant from each other, thus each wire is 300 feet long; the end posts which receive the strain of the wires are set at an angle adverse to each other. The first wire is fastened 22 inches from the ground, the other two 16 inches from each other; this brings the top wire $4\frac{1}{2}$ feet high, which is found to be so nearly the proper height as to be universally adopted. The renewal or long-cane system is generally practiced here in pruning. The varieties are largely Concord and Delaware; perhaps three-fourths are of the former variety, the Delaware following next, then Catawba and Norton's Virginia. This latter is grown especially for coloring the wine of the Concord and Delaware. Some others of the older varieties were, to a limited extent, found, and many of the newer sorts were on trial. About seventy-five per cent of the grapes grown are manufactured into wine. The cultivation is constant through the summer months,—no grass or weeds are allowed a place in these vineyards. Some use the two-horse wheel-cultivator, but most use a single-horse pattern, manufactured in the city, an excellent implement, and well adapted to the heavy soils of that locality.

THE BRUCKNER VINEYARDS.

The first vineyard examined was that of Henrietta Bruckner, a young maiden, and bequeathed by her father, the late Christopher Bruckner. A goodly inheritance from a wise father, and most sacredly appreciated by a dutiful child. It was christened in her honor, and named the "Henrietta Vineyard." It contains two acres, and was planted in 1868. In this and the one adjoining, owned by her brother, the limestone crops out so near the surface as to make it difficult to cultivate. The surface was literally strewn with fragments of the rock broken loose by the plow, and some spots were noticed so destitute of any soil whatever that it seemed impossible for anything to root or grow at all, and yet the most luxurious vines and the finest fruit were found on many of these spots. One thousand of the vines in this Henrietta vineyard are Concords, the balance Delawares; and to this little vineyard belongs the credit of producing the largest and most even clusters of the Concords anywhere found in our journeyings, and the Delawares equal to the best. Adjoining this was the one entered by George W. Bruckner in the same class, No. 23. This vineyard contained more of a variety, and was a sort of trial plat, but as usual the Concord predominated. Very fine Norton's Virginia, Ives, several of the hybrids, the Iona, which is very poor in these Monroe vineyards. The Hartford Prolific is in perfection here. We found the vines still loaded, although a month after ripening, with the berries clinging to the stem and partially dried, resembling fine layer raisins, and very sweet to the taste. A few vines of the Creveling were found with fine clusters, which was pronounced by all present the finest eating grape yet tested. The Concords on these two vineyards were all contracted to the Monroe Wine Co. at four cents per pound. The average picking up to that time was slightly more than ten pounds per vine. On inquiry as to how near should the Concord be planted, Bruckner says not less than 8 x 8 feet,—any nearer would be a decided injury. Here I might mention we found only one vineyard planted nearer. They were Concords, and planted 4 x 4 feet,—a perfect failure, and the only one in this region.

Adjoining these vineyards of the Bruckners was one of twelve acres belonging to the Detroit Wine Co., and others still added to these until the entire block contained upwards of forty acres, like one solid vinery, which it was in fact, no fences intervening to mark the boundary of each vineyard. Standing on a slight eminence, the debris of an abandoned lime kiln on the margin of the Henrietta vineyard, there were visible, at no greater distance perhaps than eighty rods from our standing point, vines from which, at that time, were hanging not less than one hundred and fifty tons of this most luscious fruit.

The "Raisin Valley" vineyard of G. W. Bruckner contains eight acres, and was next visited. It differs from the others in the vicinity only in respect to soil. A sandy ridge passes through the center of it. Here the vines were less luxuriant and appeared to have suffered greatly from the drouth, the quantity per vine measurably less, and the bunches inferior in size.

Our next move was to Snake Island vineyard, also owned by G. W. Bruckner. This and several other islands are situated in the bay at the mouth of the river Raisin; it is distant from the main land about a mile, and was reached by our party in row boats. These islands are small, of only a few acres in extent. The soil, like the main land, is black alluvial, and scarcely above the surrounding waters. The trellised vines appeared from the distance of half a

mile to be growing from the water's surface. All the land on this island is scarcely more than two feet above the waters that surround it. It contained about four acres, three of which were planted to the grape; 680 vines were Catawba, which were fully ripe at the time, September 26th. A marked feature of this vineyard was the surprising luxuriance of the vines; they surpassed anything I ever saw; any number of leaves of Catawba or Concord would measure a foot and more in diameter. This island was evidently a favorite resort of the red man before the advent of his pale-faced brethren, as large numbers of relics, such as arrow-heads, stone hatchets, spear-heads, etc., are constantly being turned to the surface by the plow and cultivator. A large stone near the cottage (a small building, and the only one on the island) was hollowed several inches deep in sharpening their hatchets or tomahawks. At a little distance lies Seminary and Sterling islands. The former is owned by Prof. Erastus K. Boyd of Monroe Female Seminary, and boasts of a vineyard in no way inferior to the best.

AT POINT AUX PEaux.

The Point aux Peaux Wine Co. enter their vineyard of twelve acres. It is eight miles from the city, and occupies a prominent point or peninsula extending into the lake. This point was the trading post of the early French traders in their barter with the Indians for their furs, hence the name "Point aux Peaux" when rendered in English is "Point of Skins." Twelve thousand vines are in this vineyard; the Concord in largest quantity, but Delaware and Catawba are largely grown. The grapes in this vineyard are all manufactured into wine, and enough of Ives and Norton's Virginia are grown for coloring the juice of the other varieties. The first vines were planted in 1866, and the balance in 1867. The Delawares were sold this season to the Detroit Wine Co. at six cents per pound, and nearly all delivered at the time of our visit. One and two-thirds acres produced 13,157 pounds. For a vineyard of its extent, none were found in our examinations that equaled this in perfection of management, and it certainly reflects great credit on the gentlemanly proprietors, Mr. and Mrs. Sterling Wolfe and others whose names I did not learn. Their wine cellars, mashing and pressing rooms were models of neatness, showing the care and scrupulous cleanliness throughout necessary in manufacturing this delicate beverage. In the wine cellars were noticed arranged in rows on one side, twelve casks of 500 gallons capacity each, and as many more of smaller size, with kegs and barrels in such numbers as to so completely fill this cellar that but little standing room was found for persons of the modest pretensions of your committee. The casks were mostly filled with wine, the vintage of former seasons. The wines of this firm have a flattering reputation wherever they have been tested, and the demand bids fair to exceed the supply; it is sold almost exclusively for sacramental and medicinal purposes, and ranges in price, for ten gallons or more, at from one to two dollars per gallon.

At Thomas Doyle's we found a garden well filled with grapes and other fruits, which for order and neatness was worthy of more general imitation. In finishing up the record of our labors at this steady old city of Monroe there are many things necessarily omitted. We hope, ere long, to advert to these subjects again, and supply such omissions as are appropriately connected with horticultural progress in our State.

AT IONIA.

From Monroe our next entry was that of N. E. Smith of Ionia, 150 miles distant. Our route was by the Flint and Pere Marquette R. R. throughout the counties of Monroe, Wayne, and Oakland to Holly, and thence by the D. & M. R. R. through the counties of Genesee, Shiawassee, Clinton, and Ionia, to Ionia city. At Holly we were obliged to wait several hours for a train in the direction of Ionia, and learning of a large apple orchard some two miles north of the village we concluded to pay it a visit. A brisk walk of thirty minutes brought us to George Pearson's, who, on putting in an appearance, eyed us somewhat suspiciously,—taking us, evidently, for a trio of sharpers: Avery no doubt filling the bill of the life insurance man, and Betts the book peddler,—but on assuring him we had no design on him, simply wished to see his orchard for the benefit of the State Pomological Society, we were heartily welcomed. The orchard contained twenty acres, planted nine years, mostly to the Baldwin; on quite an elevation sloping to the east; soil heavy clay mixed with gravel: a good soil for the apple. Many of the trees had suffered severely from the effects of the severe winter of a year and a half ago. Mr. Pearson would not set root-grafted Baldwins again; would plant the Northern Spy and top graft; the Baldwin fails always in the trunk of the tree; nor would he plant Greening, Fall Pippin, Spitzenburgh, or Golden Russet; the first is too tender, the Pippin and Spitzenburgh are poor bearers, and the Russet is unsaleable.

At Ionia we parted company with our chairman, Mr. Betts, with many regrets. His amiable disposition, his cheerful countenance, his close observations and practical suggestions, were qualities we could ill dispense with. Pressing business engagements demanded his presence at home, and Mr. Avery and myself were obliged to catch the next train at Ionia, when it was thought advisable to adjourn until the following week. At this place we arrived in time for a breakfast with Mr. N. E. Smith, who had an apple orchard, a Concord and a Delaware vineyard entered. The apple orchard had been set fifteen years on a heavy opening soil, two hundred feet above the Grand river, and distant about one mile. This was without exception the best apple orchard on our list of entries. Most of our standard varieties in cultivation in this State were found in the orchard, and all without exception in the greatest perfection. Mr. Smith had well cultivated the ground this year, and sown to turnips, which were a failure in consequence of the drouth. No orchards throughout the length of our travels exhibited such perfect health as this, and the trees, for the time planted, were of prodigious size. The crop of fruit was enormous, and the finest specimens of Northern Spy, Baldwin, Greening, Fall Pippin, Talman Sweet, and in fact all the varieties in this orchard were of great size, and remarkably free from blemish of any kind; hardly a specimen could be found injured by the codling moth. Mr. Smith attributes the freedom from injury by the codling moth to cultivation. Before he commenced cultivating his orchard annually he lost one-half by codling moths. This orchard is in a very exposed situation; nothing to break the force of the winds from the south and west or the north, for a long distance at least. It was suggested that some protection would be advantageous, when Mr. Smith remarked that he would not have any if it could be furnished for nothing fifty feet high. Mr. Smith's vineyards ranked very high in the scale of comparison, and especially the Concord. The renewal, or long-cane system, which is adopted at this place for

pruning, has been found so nearly correct in the management of our rampant growing, hardy grapes of the north as to be universally adopted by the most successful vintners in the northern States. The pruning and cultivation at this place was not, perhaps, as systematic and complete as that practiced among the vineries of Monroe; still, it must be acknowledged that the fruit for quality, and quantity as well, was fully equal this season to the best found at that place. The vines were trellised to posts, set eight feet apart, using wooden slats. It would be better to use wire, as the less number of posts required would make up for the extra cost of wire. They were also trained rather too low; another line of wire or slats sixteen to twenty inches above would be far better. This Concord vineyard was bearing an average of twenty pounds to the vine—much too heavy a crop to be often repeated. The Delawares were planted three years, and tied to stakes which were much too small and too slightly driven, as many of them were found borne to the ground under the weight of vine and fruit. This vineyard also ranked very high, and came the nearest in point of perfection of fruit to the Messrs. Chilson of Battle Creek of any examined, and had it been one year older, would have been a formidable competitor. The show of fruit, for size of bunch and berry, was nearly if not quite equal.

THE GRAND TRAVERSE DISTRICT.

A week's rest and some attention to business at home, and we are on the road to the Traverse region. Arrived at Traverse City at 7 o'clock P. M., after a ride of twelve hours over the G. R. & I. R. R. Only two members of the committee, Sleeper and Adams, were found able to make this trip. Secretary Thompson joined us at Grand Rapids and accompanied us throughout. We were met at the depot by many of the people of that interesting locality, and taken in charge and hospitably entertained by the Hon. Perry Hannah, of the enterprising firm of Hannah & Lay. Our first work was among the orchards and gardens of Old Mission, on the Peninsula between the east and west arms of Traverse Bay, and twenty miles distant. An early start, in company with Prof. Tracy and Mr. Wm. Marshall of Old Mission, by the wagon road, which led us through an interesting and picturesque country, with many of the finest landscape views constantly in sight, we brought up at the Tracy farm fully prepared to do justice to the bountiful board spread for our use by the accomplished lady of the lithesome Professor. Secretary Thompson had arrived in advance by boat at Old Mission. We joined him at Mr. Parmelee's in the afternoon. In this vicinity there were eight apple orchards, one pear, two plum, two cherry, and one plat of raspberries entered for our inspection. The plat of raspberries entered by Geo. Parmelee were first examined; it contained seven acres, all of one variety, the Philadelphia. They showed great care in planting and after culture. They were in hills 4x6 feet apart, and bore unmistakable evidence of having yielded an enormous crop. Many were not gathered for want of preparation to handle such an unexpected crop. Too much of a good thing, friend Parmelee. A rampant growth of canes betokens a crop prospectively greater even than that of the present season, and the owner will study his interests best by timely preparation for their disposal.

Our next work was an apple orchard, planted two years, all Golden Russet, and twenty acres in extent. This variety attains a perfection in this locality unsurpassed in any other section visited; hardly a missing tree was found in the whole twenty acres. The ground was cultivated in corn the first year and

oats and peas mixed the present season. The health, vigor, and form of these trees was as near perfection as could be desired. Select the finest and best formed tree your fancy indicated, and it would be no more than a fair sample of all the rest. Next adjoining was the pear orchard of twelve acres. A part has been planted six years, some three years, and the balance two years. The varieties are mostly Bartlett, Sheldon, and Beurre d'Anjou. This latter Mr. Parmelee regards as too feeble a grower. A few other sorts, such as Flemish Beauty, Seckel, etc., make up the balance in varieties. This orchard was a beauty; I doubt if a finer one, all things considered, can be found in the State; it reminded one of the celebrated Yeomans orchard, of Walworth, N. Y., in its best days, except those were dwarfs and this orchard is all standard trees. The cherry orchards have been planted three years; fifty trees each of Elton and English Morello. They produced a large crop of wheat this season and made a heavy growth of wood. They were twice the size of trees usually set the same length of time. Your committee unhesitatingly pronounced them the finest 100 trees they had ever seen in one plot; symmetrical in form and in perfect health. Surely Mr. Parmelee must have an artist's eye to render his trees to such perfection in form. Mr. Parmelee's entire orchard contains 120 acres in one body, no division fences intervening.

The plum orchard of Mr. Barney was next attended to. There were fifty trees, in two rows sixteen feet apart, and eight feet apart in the rows; much too close; evidently planted with a view of removing every alternate tree in the row, which cannot be done now without destroying the trees removed. It had better be done, however, and the sooner the better. The Ransom process for trapping the curculio, so much in practice at South Haven and along the Lake Shore, is the only system practiced here. In the absence of the owner we had no means of ascertaining the varieties. The trees were healthy, vigorous, and of large size for the time planted, being set five years.

Next in order was the plum orchard of Mr. McCallum. This contained two acres, set five years, and twenty feet apart each way; a much better orchard than the one last mentioned. The cultivation had been much neglected the present season; it had been planted to corn and squashes, and the crop apparently left to care for itself. A prolific growth of weeds was the consequence. We were informed that the owner was building two houses, superintending the Alden drying house of Reynolds & Tracy, and had, besides, much other business on hand,—too many irons in the fire.

William Marshall has the finest bearing apple orchard found on the Peninsula; has been planted thirteen years and contains ten acres, nearly square. There were four rows of Golden Russets, four of Baldwin, four of Greening, and the balance mostly of the best standard sorts. This orchard was thoroughly cultivated, without cropping, and in addition the trees were heavily mulched with coarse litter. Mr. Marshall has found that a crop of grain grown in his orchard has always been at the expense of the crop of fruit. The trees this season were bending to the ground with their loads of most perfect fruit. The Golden Russet is in great perfection and evidently the "boss" apple in this locality. We were informed that the four rows of Golden Russets had proved of greater profit up to the present time than all the balance of the orchard. We set this orchard down as the nearest perfection of any found yet, if we except Smith's of Ionia. Order reigns supreme here,—garden, orchard, field, and forest have suffered in no respect for want of attention at the hands of William Marshall.

Windsor Golden's was next on our line of march. He has an apple orchard planted the same time with Marshall's, thirteen years. It occupied a rolling piece of ground descending to the west to quite low ground. This portion was planted to Golden Russet, and has suffered greatly by the severe winter; in fact, many of the trees throughout the entire orchard bore traces of serious injury from some source. On enquiring as to its previous management, found that the season previous to the cold winter of 1872 and 1873 it was thoroughly cultivated and kept in a vigorous growing state until late in the fall; it is evident that the following severe winter found these trees in a succulent and unripe state, and hence the injury. The varieties were the usual standard sorts—Baldwins very superior, Greenings good, Northern Spy below an average as to quality, and this we found to be the case generally with this variety in the Traverse region. A large number of Talman Sweet were noticed, quite too many for profit; they should be grafted to Baldwin or Greening.

The orchard of Benjamin Montague, although not on the list of entries, would compare favorably with many that were. It was well cultivated, not a weed found growing; trees of splendid form. Here were some of the finest specimens of Greenings found on the Peninsula. A few trees of Easter Beurre pear loaded to their uttermost capacity with specimens of fruit which were marvels of beauty, and colored on the sunny side to a deep crimson; and I might mention here that the coloring of the fruits of this section is a peculiarity not found to exist to the same extent in any other locality in our State. The Greenings, almost universally, were found to equal in brilliancy the Maiden Blush grown in the more central and southern portions of the State, and the same may be said of the Fall Pippin, the Roxbury Russet, and many other varieties. The Talman Sweet was not recognized, in consequence of the brilliant crimson cheek on the sunny side. Mr. Montague had set a new apple orchard of 400 trees, mostly Greenings, which were found under the careful management of this gentleman in a very flourishing condition.

Messrs. Reynolds & Tracy enter a specimen orchard in class 5, quality prime consideration. The orchard exhibited contains fifty-three varieties, one tree of a kind, with vacancies left for eleven more to complete a plat of sixty-four varieties. This is an experimental orchard to test varieties not yet introduced in that region; the test embraces the most prominent varieties in order of ripening from earliest to the longest keeping sorts, commencing with Red Astrachan and ending with Rawles' Janet. It was planted the present season, and had made an excellent growth in the main. This trial orchard must evidently be of great service in aiding the future orchardist in making selections suitable to that locality. But I fear Mr. Tracy will find to his cost much serious disappointment, and but few dimes as a reward for his pains. Adjoining was the main orchard, planted for commercial purposes, containing thirty acres; this was of more uniform size, being confined to fewer varieties, and this orchard contained only sorts omitted in the specimen plat. Around the trees were noticed bands of stiff roofing paper twice the size of the diameter of the trees, and not in contact with them, for the purpose of preventing the cut-worm from ascending the tree and devouring the foliage. These pests seem to be very destructive in this western region, and also along the lake shore from Spring Lake to St. Joseph. Will Prof. Cook tell us whether these are identical with the cut-worm that destroys our corn in early spring in the central part of the State? Most of the Reynolds and Tracy orchards were in sod or crop of some sort, with cultivated strips of from four to six feet wide on either side of

the row. This was the system universally practiced in this section with the newly-planted orchards, when the ground was in grass or crop. Cast your eyes in any direction along the line of trees, and no variation was perceptible.

Mr. Tompkins has 430 apple trees, mostly Golden Russet,—a few Baldwins, Greenings, and Wageners. They also were cultivated in strips planted to corn. They had been set two years. The pruning in this orchard was badly done, or not done at all. He could learn a valuable lesson in this branch of horticulture by a visit to his neighbor Parmelee or Benjamin Montague. We were told, however, that the trees were a refuse lot when purchased, and bought at a low price, no others being available at time of planting.

John Allison has a good orchard of small size, planted thirteen years. It was found in clover sod; it should have been cultivated. The trees were of large size for the age, and in perfect health. Two rows were Northern Spy, and extra fine specimens they were. A few trees of Esopus Spitzenburg were noticed carrying an enormous crop free from codling moth.

An orchard of about 100 trees set four years, owned by J. E. Savage, and cultivated in strips, balance to clover, was found to be injured by the winter to a greater extent in proportion to number of trees than any hitherto examined in this locality. Pruning bad here; trees headed much too high; would refer him also to friend Parmelee for instruction as to proper mode of pruning.

The last orchard examined in this vicinity was that of A. K. Montague, about mid-way between Old Mission and Traverse City. It contained thirty acres. All, or nearly all, was in crops of some kind—principally in corn and potatoes, with a few acres to corn sown for fodder. The trees were nearly all Golden Russet,—had made a heavy growth, but many of them were in bad shape, headed as much too low as the preceding one was too high, most of them not more than two feet from the ground. Had the pruning been properly done, this orchard would have ranked very high and held the Parmelee orchard in close competition.

Before taking leave of this promising fruit section, we must not omit to mention the nursery establishment of C. P. Avery, a member of our Orchard Committee. This is a new enterprise with friend Avery, whose modesty would hardly allow us to mention his establishment at all were himself consulted; nevertheless it is but justice to say we found several blocks of fine, thrifty, and healthy trees which would do credit to many older and more extensive establishments.

The people throughout this entire section are persistent and thorough in their determination to hold in check or destroy the insect enemies to fruits and trees. Hardly an orchard was seen without the bands for catching the codling worm, and persons who neglect this precaution find neighbors willing to do the work for them. Altogether it may be said of this region, as a fruit section, it bids fair to equal, if not rival, many of the older and apparently more favored portions of the State. It seems to be especially the home for the apple and the pear,—many of our leading and most popular sorts attaining a perfection here unequalled in any other locality in our State. The Greening, the Baldwin, the Golden Russet, and many other sorts, are nowhere excelled. All the smaller fruits, except the grape, perhaps, are grown as well as in many, and better than in most other sections of the State. The grape was not up in quality to those grown in the interior or the more southern localities, and still the vineyard of Judge Ramsdell, at Traverse City, showed unmistakable evidence, under his dexterous and careful management, of being a success. The

Delaware, the Ionia, the Concord, and several of the hybrids ripen in perfection, as was well attested by samples of wine as well as fruits, which your committee examined.

But these people are a determined race, and any deficiency of variety or soil, or anything else attainable, they are bound to supply. They have a fine climate, a fertile soil, a ready market, and are bound to succeed. Nowhere within the borders of our State can a people be found more fully alive to the subject and *success* of horticulture than these people of the Grand Traverse region.

AT SPRING LAKE.

The peach orchards of Spring Lake as a whole were found not quite up to the better class of orchards in many other sections of the State. The severe winter of 1872-3 left its trace in mostly all of them. It came like an avalanche, and the shock was terrible; add to this the neglect of culture and the proper cutting back, which was in most cases neglected, and the result stands to-day a monument of disaster. The sandy nature of the soil, with little natural elements of fertility and none of any amount supplied, must ever in like seasons of great severity place the growing of the peach in great peril. I speak of these conditions and the results only because I found they existed almost universally at this place; and yet it must be acknowledged that there were found some notable exceptions. The orchard of Thomas Petty and Frank Hall, and also the young orchard of J. B. Soule, stood well up in the scale of merit. There are without doubt many farms about Spring Lake that have as good soil for the peach, and possibly the apple and the pear, as in many other sections of the State, but the orchardists of this locality seem to have passed them by, preferring the more convenient and easier cultivated sandy soils immediately bordering on the lake and along the margin of the Grand river. These light, sandy soils are well enough during the earlier stages of orchard culture, but when the trees have attained the growth of a few years with the attendant crops of fruit, the strain is too heavy without some extra fertilizing material, which appears difficult for these Spring Lakers to obtain. Their greatest reliance should be in seeding to clover and a liberal use of land plaster, to be turned under as often as once in two or three years, in June, or when in full bloom. Another one of their great needs is an *active, live*, and energetic Horticultural Society. They have a Horticultural Society, but judging from the effect it is having on the fruit interests of this locality, it must be in a sorry condition, to say the least; all the enterprise in a fruit direction appeared to be wrapped up in less than half a dozen individuals. Had they a society as energetic as the South Haven Pomological Society, or the Peninsular Farmer's Club of Grand Traverse, a marked improvement in the development of the fruit interest would be manifest at once.

Their system of pruning the peach may have its advocates and succeed with some, but as a rule can never obtain the best results. I do not remember ever to have seen a more objectionable system practiced, unless it may be among orchards farther down the "belt." The long, naked arms or main branches, without a lateral from the body of the tree to near the extremities, may serve to let the sun and air to the center of the tree, only to find neither foliage nor fruit to appreciate the favor. Many of these long branches were noticed broken from the tree by their own weight when racked by the winds or by the weight of fruit. The shortening system I am well convinced would be much preferable in this locality.

The orchard of Thomas Petty was by a large per cent the best of any entered at this place in full bearing. The location was a hillside sloping to the southeast. Soil quite sandy; nearly as much so as any found in this locality. In cultivation it ranked perfect. The cultivator and harrow were put in requisition as often as once in ten days or two weeks during the season, keeping the weeds down and inducing moisture in the soil. No crops are allowed to mature. It is sown to rye in autumn to keep the sand from blowing away from the trees and for fertilizing by plowing under in the spring. All the facilities for manuring are taken advantage of, and ashes, lime, muck, and barnyard manure are applied as a top dressing. The pruning was less at fault than any found elsewhere at this place. The trees were more compact and symmetrical, with less of the sprawling habit noticed generally where the shortening system is not in practice. There were no borers to be found. Mr. Petty has an eye on them; he goes over his trees twice a year, and prefers the month of June for his work. He has not taken any especial pains to trap or jar, for the curculio is not much trouble to him as yet. His varieties are Early and Late Crawfords, Hale's Early, Barnard, Smock, and Hill's Chili. Considers the Late Crawford the most profitable for market, and still the Smock netted the most money this year; this orchard of about 1,000 trees netted \$1,600 this season. Mr. Petty is a careful, industrious, and observing man, and has the best orchard examined in the vicinity of Spring Lake, and was a close competitor with the Engle Orchard at Paw Paw.

The two-years-old orchard of A. B. Soules was a very perfect orchard of ten acres in extent. It was brim full of merit, not a tree missing, all of uniform size, well grown, and in most perfect shape. It was the only perfect two-years-old orchard met with while on our journey. I much desire to see the shortening in system practiced in the management of this orchard, and contrasted with the straggling skeletons with which it is now surrounded.

The bearing orchards of A. B. Soule, J. B. Soule, and Hunter Savidge, were all severely injured with the cold winter, and that of Mr. Savidge was about one-half planted anew—this might better have been done with the others above mentioned—many of these orchards were alternated by planting the apple among them in quincunx order. This mixing up of orchards with different species is open to many objections which it is unnecessary to mention here. They are all pruned on the long-arm plan, and most wretched appearing specimens many of them were. The varieties embraced most of the leading market sorts, with the Crawfords in greatest numbers.

Frank Hall, next to Thomas Petty, has the best bearing orchard here. Notwithstanding it had been injured like the rest by severe cold, it was found to be really a good orchard. Soil light, genuine Spring Lake sand, sown to winter rye for the same purpose as was Mr. Petty's. The cultivation, pruning, and management in general was a repetition of Mr. Petty's plan, and marked next to his in all points of quality and perfection.

With the orchard of Theodore Curtis on the west bank of Spring Lake we finished up the work at this place. This was quite a large orchard when first planted six years ago, but the winter has done a work of destruction here with no light hand. I am willing to believe whoever saw this orchard during or previous to the autumn of 1872 beheld one of great promise. The soil here is some heavier than east of the lake, but the location is most too flat and level. There is not much of an orchard left now; with the utter neglect in cultivation and pruning and the management in general through the past season, it is hardly possible to consider it in a condition otherwise than hopeless.

A few words on the importance and character of the orchard committee. There is perhaps no work done through the instrumentality of the State Pomological Society that ranks in importance and vital interest to the fruit growers of the State with this work, and none so difficult to perform. Its magnitude and character is such that it is difficult to find persons that can, or are willing to, sacrifice the time and expense necessary to perform the duties required. To one of your committee it has involved the present season not less than twenty-four working days in examining the orchards, gardens, and vineyards on our list of entries, and upwards of 1,300 miles of travel by rail, traversing twenty-five different counties of the State. Here is too much work for the time given, but we could spare no more. I must repeat the suggestion of a former committee that *three* men are sufficient. Our committee of *five* was too large, and much difficulty was experienced and time lost in endeavoring to get them together and keep them long enough to finish the work in one locality. Most of the time not more than two, or three at best, could be kept together, and much of the work was done by one alone. I believe that three are better than more, and two better than three, and that *one* thoroughly competent person who could spare the time, and if necessary call to his assistance pomologists in the different sections visited at the time of examination, would be far better than a greater number, and the work would be done with less expense and more effectually. This person could take abundance of time, and should be allowed a reasonable compensation per diem for his work.

THE COMMITTEE MAKE THEIR PARTING SALUTE.

It is exceedingly appropriate to say that our acknowledgments are due to the pomologists of the various places we were called to visit, and especially are we under many and lasting obligations to our friends of the city of Monroe and vicinity, to the people of the Grand Traverse region, to the Pomologists of Spring Lake, Adrian, Battle Creek, Jackson, and Ionia, for the manifold attentions and kind hospitalities that greeted us on every hand. They have loaded us down with a debt of gratitude too great, I fear, for us to cancel, with the uncertainties of human events before us. They have our heartfelt thanks and kindest wishes. We cannot close without contributing our feeble testimony to the very liberal and generous spirit extended to us by the several railroad companies, and for the material help in furnishing us free passes over their respective roads. We would especially acknowledge our obligations and extend the thanks of our society to the Grand Rapids & Indiana, to the Flint & Pere Marquette, to the Chicago & Michigan Lake Shore, and the Detroit & Milwaukee Railroads, who rendered us all the aid we could desire in furthering the progress of our work, and we only regret that the Michigan Central and the Michigan Southern saw fit to treat our society with a less liberal policy. These roads are old roads, and have grown rich in the development of the agricultural and horticultural interests of the State, and would have suffered in no material manner had they passed our committee over their lines, thus aiding our society in the same spirit with the other roads of the State. Nor would we omit to mention the liberality of Messrs. Dexter & Nobles of Elk Rapids, in placing at our disposal their steam yacht the "*Jennie Sutton*," during our stay at Traverse, and also for their kind invitation to view the scenery around the inland lakes from Elk Rapids through Intermediate, Torch, and other lakes seventy miles distant, and back, free of cost, on their elegant steamer *Queen of the Lakes*. It was a sad disappointment to us that time would not permit of our accepting their very kind invitation.

A word further as to the future pomology of our State.

While her cultivators have done much, I might say everything to encourage them, let no one for a moment believe that he has only to *plant* and simply gather his fruits. It will require *care*,—thoughtful and intelligent care; a constant watchfulness is demanded at every step; unpropitious seasons, the excessive cold of winter and the drouths of summer have to be provided for. Insect depredators are constantly appearing and multiplying their species, requiring his constant vigilance to exterminate or hold in check. Locations for special kinds of fruit have to be studied, and soils properly adapted to the different species must be selected and deficiencies supplied, and many other requisites must accompany his steps before success is made sure. Still, as I have said, they have many things to encourage them; the advantages of *location*, climate, and variety of soils adapted to the growing of nearly all the valuable fruits of the temperate zone, are unsurpassed by any State of the union. The influence of the great lakes by which she is nearly surrounded, modifying the winter's cold and checking the summer's heat through the length and breadth of our State (for I am not one of those who believe that the influence of these waters is confined to the narrow limits of a few miles along our western borders), are advantages enjoyed by none other. Her *position*, midway between the "great west" and the Atlantic States, and within easy range of either, must ever afford an early market for her productions. Nor is it stretching the line of prophecy to say that at no distant day the Raisin shall rival the Rhine in the value of her vintage, and Michigan stand unequaled among the States of North America in the wealth of her horticultural productions.

THE CODLING MOTH.

ADDRESS DELIVERED AT THE IONIA MEETING OF THE STATE POMOLOGICAL SOCIETY BY PROF. A. J. COOK OF THE STATE AGRICULTURAL COLLEGE.

What wonder if some of you, upon noticing the subject of this address to be given at this meeting, in view of the fact that the same theme has been discussed at nearly every previous meeting, did bethink you of twice-told tales vexing the ears of drowsy men; yet I offer no apology for bringing it again to your attention. Our worthy secretary, so alive to the best interests of pomology and pomologists, gave *ex-cathedra* commands that I should do so, and more, that I should cover the whole ground, explaining every point both small and great. The whole people demand more information, while the importance of the subject calls loudly for the fullest investigation, and no less that the truths, scientific and economic, should be scattered broadcast so soon as gathered.

Why is it that every newspaper, magazine, and association of France is at present teeming with discussions of the grape vine *Phylloxera*? Is it the generous reward offered for a remedy of the evil? Oh no! but rather that the extraordinary annual destruction of \$300,000 worth of property awakens the most vehement effort to learn fully the nature of the evil, its cause and preventive.

CODLING MOTH.

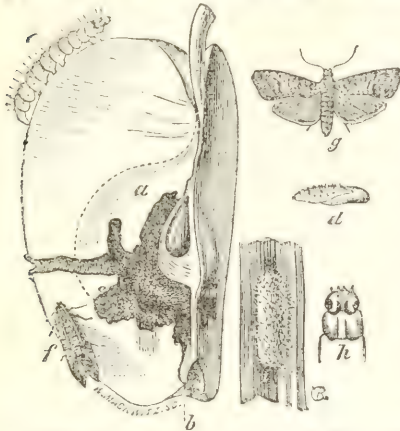
(*Carpocapsa pomonella*—Linn.) Sub-order *Lepidoptera*. Family *Tortricida*.

The Codling Moth is the *Phylloxera* of our fruit-men, which, to quote from Secretary Thompson, destroys annually more than the State Agricultural College has cost, from first to last, and will, unless checked, destroy enough in ten years to pay for our State Capitol. How wise then to give it a full discussion at each and every one of our meetings, till the perfect knowledge of its natural history and habits is the common property of all the pomologists of our great fruit State.

I am the more willing to discuss this subject again at length, as from my own researches, and those of others, I am enabled to speak more fully and definitely in respect to many of the phases in the history of this interesting insect.

Should I fail to be sufficiently explicit in any particular, I hope that in the

discussion which shall succeed the lecture attention may be called to such points, that everything may be made entirely clear to every one.



(a) Portion of apple eaten; (b) Place of entrance; (c) Larva leaving the apple; (d) Pupa; (e) Imago with wings folded; (f) Same with wings expanded; (h) Head of larva magnified; (i) Cocoon.

The Codling Moth at this time, or during the winter, hibernates as a larva (see *c* in cut), or in common parlance a worm; yet this larva is not at all unprovided to resist the winter's cold, for ere it betook itself to its long quiescence, it spun its silken robes or cocoon (see *i* in cut), not to assume the pupa state, for usually from the time it spins its cocoon, which occurs from the middle of August even to December, it remains a worm or larva usually till the next spring. Nor has its wondrous instincts left it all exposed to those best friends of the husbandman, the insectivorous birds, for this larva does not don its winter robes till snugly ensconced in some crevice, under some bark, beneath some board, or forsooth within the folds of some suspended cloth or paper, it seems hidden from clamorous bluejay or prying sap-sucker.

PUPATION OF WINTER LARVA.

Thus these whitish larvæ, often tinged with pink, less than three-fourths of an inch long, with black head, sparsely covered with hairs, and possessing sixteen legs, remain till two or three weeks before the moth appears, when it assumes the pupa condition (see *d* in cut). The pupa is brown, less than one-half of an inch long, while along the back of each segment or ring (these rings along the posterior of the chrysalis are plainly marked features of all lepidopterous pupæ), may be seen two transverse rows of minute spines. After remaining in this condition for two weeks, more or less, they change to the imago state (see *f* and *g* in cut).

WHEN DO THE SPRING MOTHS APPEAR?

Dr. LeBaron, in his admirable discussion of this insect, contained in his third annual report as Entomologist of Illinois, gives as the time of the appearance at Chicago from May 12th to May 20th, which dates agree with my own experience for several successive years. Prof. Riley, State Entomologist of Missouri, whose good work in scientific and economic entomology has carried his name and fame even to Europe, says in his fourth annual report that the spring moths come with the apple blossoms. Now while these statements are generally correct, the past season has given a strange and wonderful variation, which may teach us that we should glean very many and oft-repeated facts in natural history before generalization is safe, for true it is that these spring moths appeared in our State as early as February. Noticing in a February number of the South Haven Sentinel that L. H. Bailey of that place,—who, by the way, is setting the youth of our State an example worthy of imitation by his earnest work in natural history,—reported to the pomological society of that place the appearance of codling moths, thinking that there must be some error, I sent

to Mr. Bailey and obtained some of these early visitants, which surely enough were the veritable *carpocapso pomonella*. In April they commenced to appear with us in Lansing, and thus on I saw moths flying till the very last week of June.

DESCRIPTION OF MOTH.

Right here let me describe the imago (see *f* and *g* in cut), for true is it that there is an astounding ignorance, even among our leading fruit men, as to the appearance of this moth. Only last summer one of the most intelligent and best informed pomologists of our State came to my house and reported the codling moth in swarms about his apple trees. Upon inquiry I found this was a *daily* occurrence; I told him this must be incorrect, as the codling moth was nocturnal, not flying by day unless disturbed. I then asked the color, and found that they were white. Surely the ignorance as to some of our most common insects is quite as extreme, and far more real, than was that of the affected Miss who, upon return from boarding-school, asked her brother if those hay stacks were plows.

The moth with wings folded is three-eighths of an inch long, and expands more than six-eighths of an inch. The head, thorax, and abdomen are slim,—the two former gray, specked with brown, while the last is ringed alternately with gray and brown. The primary or fore wings are beautifully mottled with gray and brown, while towards the tip is a large brown spot, with the lustre of copper; beyond this and tipping the wings is first a gray, then a brown band. The secondary or back wings are a lustrous brown with a light fringe. Beneath, the primaries have a copper lustre, while the secondaries are more grayish. The eyes are black, between which are situated the antennæ, which are about two-thirds as long as the body. The tongue, or sucking-tube, is not obsolete, as might be supposed, but is about twice as long as the head.

HABITS OF THE MOTH.

These moths, I have found by repeated experiments, will not live in confinement more than a week; that they are as short-lived when unconfined is doubtful.

Many lepidopterous insects take no food when fully matured, or in the imago state; yet I have found, as reported by Dr. LeBaron, that they will sip sweetened water when in confinement. As Dr. LeBaron states, they doubtless sip the liquid sweets of flowers, very like the apple blossoms.

These moths are nocturnal, remaining quiet and concealed by day, though they will move if disturbed. They are seldom seen except they pupate in our cellars or kitchens, and coming forth usually in the night fly to the windows in their desire to get where they may revel in the midst of perfume and bloom, and are impaled on the window pane, where they remain often for two or three days. Last fall (1873) we kept affected apples in our kitchen, and all through the weeks of late spring and early summer my wife caught these moths upon our windows, some of which I have brought along that you may examine them and hereafter know the moth.

These moths soon pair, and then the female is ready to sow the seeds of future destruction,—for which work she is well prepared, as by examining her ovaries with a high power we may count as many as fifty eggs. Many of you are familiar with the fact that in examining the ovaries of our fowls we find groups of eggs of different sizes; these groups develop successively, from those with largest eggs to those with smallest, at successive periods of ovulation or

egg laying. This is no truer of fowls than of all our higher animals, even to the genus homo. Now, Dr. LeBaron claims to have discovered such gradations of size in the ova of the codling moth, and thus reasons that the moth, under normal conditions, doubtless lives for quite a period that the lesser ova may develop. I have been unable to find such gradations in the size of the ova, even with a high power. If their longevity is greater than one week, it seems strange that they die so soon in confinement, as moths and butterflies, if virgins, will often, aye generally, outlive their sisters who are subject to the usual conditions. I have myself confirmed the truth demonstrated by the renowned Reamur, who kept a virgin butterfly for two years in his hot-house, by keeping virgin moths alive for weeks, when in nature they would scarce have lived so many days. Hence from analogy we would pronounce the moth as short-lived. After all, Dr. LeBaron may be right. Positive experiment, not induction, settles points in natural history. We shall speak again as to these different sized eggs and their bearing on the longevity of moths in the sequel.

WHEN AND WHERE THE SPRING MOTHS LAY THEIR EGGS.

As we have seen, the spring moths are extant from the time the trees blossom till the very last of June. So we may say that egg-laying by these moths commences as soon as the young fruit forms, and continues through June.

These eggs are, with scarce a single exception, placed on the calyx or blow of the young fruit. During the last of May of the past season I found numbers of these tiny eggs thus placed, and showed them to my pupils. If farther argument was needed on this point, we have it in the persistent path of entry of the young larva, which is invariably by the withered blossom of the fruit to the core.

Another question of much interest relates to the number of eggs deposited in each apple. Here one can answer with positive certainty that only one egg to an apple is the rule with the codling moth. Upon very thorough examination during the past season, I never found two eggs on the same fruit. Again, very early in the season I never found two larvæ in the same apple; and when later I did find two larvæ in a single fruit, one was invariably smaller, a point which has been remarked by many entomologists. This smaller larvæ was evidently from another mother. Why the moth thus scatters destruction so broadly can but be conjectural. Professor LeBaron suggests that early the apples are so small that two larvæ would find too great a struggle for life, hence it may be that natural selection has developed this peculiar instinct. That this same practice should adhere later, when the necessity has disappeared, would argue that instinct, not reason, was the controlling power.

THE EARLY LARVÆ.

After about a week, the time varying slightly with the season, the eggs hatch, the young larva goes immediately to the heart of the apple, where it has a very safe retreat in which to laugh and grow fat, being very successful at least in the latter respect. After about four weeks of reveling in the rich apple pulp, the mature larva leaves the apple, sometimes through the old opening of ingress, though far more frequently the opening for egress is through the side of the apple which has been made previous to the time of exit. While eating the larva fills the space eaten out with its feces. These filthy droppings may be seen in affected apples, forming a projection about the opening at the blossom, as also the opening where the larva is to escape. This exudation of fecal

matter, not unlike iron rust in appearance, enables us to determine affected apples, even though they are in the very top of the tree.

After the mature larva leaves the apple, it at once seeks some secluded space in which to pupate. If the apple is still pendant from the tree, the larva either crawls down the tree in quest of crevice or protecting bark, or perhaps rarely drops by a thread spun from the mouth to the earth. If the apple has previously fallen to the ground, the larva comes forth, and in company with its kindred, which possibly has swung down by a rope of its own manufacture, seeks for a place of concealment. If there is no board, stump, or clod near by,—in other words if clean culture is practiced, these larvæ also betake themselves to the tree trunk, and go up as the others come down, and for the same purpose. Having found the coveted seclusion, the larva soon commences to spin its cocoon, and having completed this silken covering, and having rested for a brief period, the larva transforms into a pupa.

THE PUPA STATE.

As a pupa or chrysalis, the insect is mostly quiet, only moving the posterior rings when disturbed, and in common with all chrysalides, possesses no mouth, and of course fasts during this period. After a brief fortnight of quiescence, the anterior extremity of the pupa case bursts open, and the beautiful moth emerges.

Thus we conclude that of this first brood the moths appear from the middle of May to the last of June, while the larvæ which come from their eggs will be feeding from the last of May till the last of July, and a few even early in August, and as the pupa state continues two weeks, the second brood of moths will emerge from early in July (the earliest I have ever reared appeared July 12th), to near the middle of August. Hence it will be seen that these two broods overlap each other, the earliest of the second brood of moths coming forth, doing their mischief and dying, ere the latest of the first brood even appeared.

This second brood of moths conduct themselves very much as did the first, though from choice, as also from necessity in part, seem to select the winter fruit on which to depredate, and sometimes deposit the egg on other parts of the apple than the blow—at least the hole where the later larvæ pierced the fruit is not infrequently along the side, though in general this is as before. The later moths, perhaps the late moths of the first brood, often deposit in an inhabited apple,—though this is the exception,—hence the finding of two larvæ in the same fruit.

The larvæ of the second brood behave in all respects as did the first, but tardy ones remaining in the apple even till winter. The larvæ seem to know that hurry is useless, taking things very leisurely; and even though they desert the apple in August, they only seek a corner to hide in and spin their cocoons. And what a strange phenomenon we have here; the early larvæ changing to pupæ almost immediately upon maturing, while these late ones, though the weather may be as warm, though all influencing conditions, so far as we can see, are the same,—remain as larvæ for weeks, aye, even months,—generally even till the succeeding May. Why the numerous exceptions of last year, is a problem not easily solved. Should we urge the warm season, which we might do with some show of reason, especially as many other insects, as the tent-caterpillar, either hatched or developed prematurely, we would doubtless be answered that South, where the climate is much warmer, this insect's habits are the same as here. Thus we are left in the dark.

Having thus portrayed the natural history and habits of this incorrigible pest, we are prepared to discuss the remedies. The great desideratum in the way of preventive is to capture the moth, thus nipping the whole evil in the bud; but as yet we are unable to accomplish this. Yet, having full faith that man's wisdom and inventive faculties are entirely commensurate with his needs, I most thoroughly believe that this discovery is to be made. And, Mr. President, I would favor the offering of a prize of not less than \$100 to the one who should determine a practical *Codling Moth* exterminator. If, as Prof. Riley says, this is impossible, no harm can result; if it brings success (I use the indicative mood) it would be worth millions of dollars.

The common opinion that lights will attract these moths, and that they may, in consequence, be destroyed by building fires, is, as stated in the report of 1872, wholly erroneous. The fact already noted, that these moths are sometimes seen on the window panes, *though in the day-time*, may have led to this opinion, though it is far more likely that it originated in the fact that many moths are thus attracted, and that even intelligent people are entirely ignorant as to the special markings of this particular species.

Nor is there warrant for the remark that sweet liquids or adhesive syrups will entrap them. I have spent considerable time and thought in experiments of this kind, but as yet with no marked success. It is clear, then, that our efforts must be directed against the larvæ and pupæ.

THE HOG TRAP.

The policy of turning swine or sheep into the orchard has long been advocated, and of late has an enthusiastic champion in our secretary. Now there is no doubt but that this method is excellent so far as it goes, and as every aid in such a contest is worthy to be brought into requisition, so as our worthy secretary cries "swine" I will add a hearty "amen." Yet in our enthusiasm in behalf of so cheap and available a trap, let us not forget that scarce more than half of the larvæ ever reach the ground at all, as they leave the fruit before it falls, and hide about the trunk or limbs without ever leaving the tree; and as swine are very far removed from those beings which are said to possess wings, they are all powerless in the destruction of about half of these insects. As a society we ought not to stop short of the very best remedies known in our recommendations. While we may mention the less useful ones, we should *emphasize* the *most* perfect.

That only about half of the larvæ do come to the reach of either swine or sheep may easily be determined by each of you. Examine affected apples never so early in the season, which are still hanging on the trees, and that too on trees which drop their apples the worst, and you will almost invariably find that full half of the apples are empty of the larvæ; and closer examination will reveal the culprits concealed about the branches and trunks. That these did not swing to the ground and crawl up I proved by the following experiment. I took a tree under which there was nothing that could secrete the larvæ, and the bark of which was perfectly smooth; around this tree I put five bands. Six examinations of these bands gave five hundred and forty larvæ, which were distributed as follows: The lowest band gave one hundred and eighty, the second ninety-seven, the third thirteen, the fourth sixty-eight, while the upper band gave one hundred and eighty-two. We thus see that the two topmost bands caught two hundred and fifty larvæ, the lowest two hundred and seventy-seven, and the middle one only thirteen. The limited num-

ber under the middle bands is quite significant as showing that very few passed three bands either from above or below.

Professor LeBaron, after some very admirable experiments with bands, concluded that only one-half the larvæ ever reach the ground.

Both Prof. Beal and Mr. Garfield have examined closely the past season, and both gentlemen found that a majority of the apples were deserted before falling from the trees.

Thus we see that hogs, though good, especially where orchards are not free from stumps, or are not kept clean, can never more than supplement the better remedy. Then, Mr. President, shall we as a society adopt a wise course if we make swine our clarion note, while a far better remedy is in easy reach of all? Or shall we not the rather give to the hogs the minor key, while bands shall sound out clear from the major.

BANDS.

It is gratifying to me to find that all who have been wise and used the bands, finally adopt what have from the first seemed best to me. The woolen cloth bands, four or five inches wide, and passed once around the tree and fastened with a long tack, which is not driven fully to the head.

WHEN AND HOW TO MANAGE THE BANDS.

The bands should be adjusted by the 20th of June, as very soon after this the larvæ will commence to leave the apples. The first examination should be made the first week of July, which, very likely, in late seasons may be fruitless, though so early an examination is safest. If such trees as the Early Harvest are first examined, we may soon learn if we are too early. It is very evident that the period between successive examinations should never exceed the briefest period of pupation. And Prof. Beal's experiments the past season of excessive heat, prove that twelve days is too long. Bands cleared entirely of cocoons, and then examined in twelve days again, revealed many empty pupa skins, showing that the bird had flown. So we say examine every ten days. As all the first brood have developed by the last week of August, and as the second brood do not leave the cocoon till the next year, no examination need be made after the last week of August till early winter, when a last thorough examination should be made.

To recapitulate: adjust the bands June 20th, and examine the same July 8th, 18th, 28th, August 7th, 17th, 27th, and December 1st.

HOW TO DESTROY THE LARVÆ.

Upon thorough consideration of the subject, I think there is no way of destroying the larvæ equal to that of withdrawing the tack, carefully unwinding the band, and crushing all larvæ and pupæ with the fingers. Prof. Beal agrees with me that for safety and speed there is no method equal to the above.

Of course all good pomologists will keep the rough bark all scraped off; this may be done at any season of the year. Smooth trees are most benefited by the washing with soap-suds, the first of June, which no one can afford to omit. Of course without the removal of the rough bark the bands will not do their full work. Clean culture, and the removal of all wood, boards, etc., beneath the trees is very important; especially if we dispense with the hog-trap. Those who have not yet used the bands should seek out and destroy the larvæ under the rough bark of their trees during the winter, while all should destroy all of the larvæ which may have hidden in crevices about their apple bins and bar-

rels. The little silken cocoon will give quick indication of their presence or whereabouts. Yet these insects are no exception to the rule of insect secretiveness, and we can not hope to destroy even a moiety of these cellar residents. Why could we not arrange to have our apple-cellars moth-tight, and then by the first of May shut them up, and thus effectually cage these miserable mischief-makers?

DR. LE BARON'S THEORY AGAIN.

We have seen that the first brood of moths are around as late as the last of June, while their pupæ all disappear the last of August. Now remembering that the eggs exist one week before hatching, the larvæ four weeks eating, the pupæ two weeks quiescent, where, then, is the time for the moths, that those smaller ova may develop? Yet, supposing that the second brood of moths have those smaller ova, which have to develop for some days, mayhaps weeks, within the ovaries, and that the moths are sufficiently long lived for this, and we may have the solution of the enigma which inhabited apples, even in December, present.

NATURAL ENEMIES.

Among the most important of these are the birds, especially the robin, blue-bird, and sap-sucker. Could I put before you an exact showing of the enormous benefits from these feathered friends, I am sure you would be filled with astonishment, admiration, and gratitude. This is why some of our fruit men have erroneously supposed that a single "worm" run riot, and instead of playing havoc with a single apple or pear, destroyed dozens. Why, say they, the "worms" are but a small fraction in numbers to the injured fruit. Yet they never saw a full grown larva in an apple without seeing at the same time a large excavation, showing that the devastator is no new comer. Could they have seen the thousands, aye, millions of larvæ which have been picked up by their bird friends, a friendship too often one-sided, they would reason better. Especially serviceable in this good work is the sap-sucker. Prof. Beal objects to the paper bands, because they become so riddled with holes by these vigilant benefactors in quest of these destructive larvæ and pupæ. Nor do they tire with the coming of those "melancholy days, the saddest in the year," for all the long winter through they are still engaged in the same worthy labor. How mean, then, to denounce them because they occasionally seek to gratify their architectural taste by honey-combing some evergreen or fruit tree, that they may rinse down their larval tidbits by lapping the oozing sap, even if they do semi-occasionally, nay, quadri-occasionally, destroy a tree. Oh, that all of us were as sure, when the books are opened, of as bright a record of noble philanthropic work as these birds!

Last July I received a letter from Hon. Henry Chamberlain of Three Oaks, Berrien county, in which he stated that Mr. R. B. Goit had discovered a worm which preyed upon both the larvæ and pupæ of the codling moth.

I afterward corresponded with Mr. Goit in regard to this "worm," receiving from him specimens of the same, with a more full account of their good work. These "worms" are more properly grubs, or the larvæ of beetles. I did not succeed in rearing any of them, but sent one to Prof. C. V. Riley, who pronounced it the grub of a beetle of the family *Cleridae*, a family which contains the grub or larvæ which, in Europe, destroys the young bees. Another of this family also destroys hams, often doing ruinous work.

I think Prof. Riley is wrong, and that this larvæ rather belongs to the family

Trogositide, and if not the identical species, is nearly related to the grub described by Dr. Le Baron, as found by Dr. Reed in Muscatine, Iowa, in his third annual report, page 182.

These larvæ are whitish, depressed, tapering anteriorly, with a brown head, and with two brown spots on each of the first three segments. The last segment terminates in a horny plate, extending backwards in two horny spines. The specimens sent me ranged from less than a quarter to more than a half inch in length. I presume the latter may have been nearly full grown, though Mr. Goit stated that he had seen them one-third larger. I think these are of the genus *Trogosita*, possibly *T. corticolis*, Mel., which Dr. Le Baron has taken under the bands, and which I have frequently taken at Lansing. I hope the following season to remove all guesswork in the matter.

Mr. Goit, who, by the way, seems an excellent observer, saw these grubs devour both larvæ and pupæ, but mostly pupæ, which were eaten in large numbers. Some pupæ enclosed with those sent to me, were used for a lunch while on the journey.

Prof. Riley describes the larvæ of two more of our common beetles, *Chanulignathus Pennsylvanicus*, and *Telephorons bilineatus*, Say, both of which feed on the larvæ of the Codling Moth.

These beetles, specimens of which I have before me, are soft-winged, belong to the family Lampyridæ, which also includes our common fire-fly, or more properly fire-beetle. These beetles feed on the honeyed sweets of flowers, and during the bright September days of last autumn, I caught a large number of the former, which fairly swarmed on our Minnesota bee plant, which, from its showy bloom and myriad insect visitors, was an attractive feature at our apiary.

These grubs, as described by Prof. Riley (see his 1st and 4th reports), are of a rich, velvety brown, with longitudinal rows of lateral black spots. The last named has an interrupted dorsal stripe of white. These beetles are caught in bottles of sweetened water suspended in the trees, which, as we thus see, are not only valueless, but a positive evil.

Nothing need be said in reference to parasites further than what appeared in the report of 1872.

I have thus risked taxing your patience by this detailed account of one of our worst insect pests, believing that the importance of the subject would far more than justify it. Not to weary you longer, I close with the following amended summary from Prof. Riley's third report:

"The Apple Worm or Codling Moth is an important insect. There are two broods a year, and the second passes the winter within the cocoon in the larvæ state. Use sheep or hogs in the orchard whenever it is possible to do so. Put no confidence in lights or bottles, but rely on the bandage system. Have the bandages in place by the 20th of June, and destroy the cocoons, larvæ and pupæ underneath them every ten days, commencing, when necessary, as early as July 8th, continuing till August 30th, and again at the close of the season, after the fruit is harvested. Destroy, as soon as the ground thaws in spring, all insects within cocoons found around store-houses, or under bark, where trees were not bandaged the previous year. Urge your neighbors to combine with you in the work.

HOW PLANTS GROW.

AN ADDRESS BEFORE THE STATE POMOLOGICAL SOCIETY AT IONIA,
DECEMBER 2, 1874, BY PROF. W. J. BEAL, AGRICULTURAL
COLLEGE, LANSING.

SOURCE OF FOOD,—ELEMENTS NECESSARY.

All substances, so far as known, are made of a little over sixty simple elements.

Chemists have proven that fourteen of these elements (bodies which have never been decomposed) are essential to the growth and maturity of every common flowering plant, and of animals too, since they feed upon plants.

One of the most common and characteristic elements of plants is

Carbon, (C.) which exists nearly in a pure state as charcoal, lamp-black, black lead, and the diamond. It constitutes about 46 per cent of plants.

Oxygen, (O.) is a colorless, odorless, tasteless gas, constituting a large part of the air we breathe. It combines with most other elements with great readiness. It constitutes more than one-half of the aggregate materials of the globe, about 40 per cent of plants.

Hydrogen, (H.) is a gas without color, odor, or taste. It is the lightest substance known. It unites with oxygen to form water. United with carbon it forms the chief ingredients of many compounds, as volatile oils, coal gas, benzines, tallow, etc. About five and a half parts out of 100 in plants by weight are compounds of hydrogen.

Nitrogen, (N.) is abundant in the air, as an inert gas, without color, taste, or smell. It constitutes about two per cent of plants, existing in a greater proportion in the seeds, and young stems and leaves which are edible.

Sulphur, (S.) is well known as a yellow substance in the form of brimstone. It exists in small quantities in all plants, perhaps 15 parts in 10,000.

Phosphorus, (P.) is never found free in nature. It consists of about four parts in 100 of plants. It constitutes the chief value of bones as a manure.

The above are the six most important elements of plants.

Silicon is never found naturally in the free state. Combined with oxygen it forms silica, an exceedingly abundant substance in sand and in most soils. The other elements necessary to plants are chlorine, potassium, sodium, calcium, magnesium, iron, manganese. Still others are sometimes found.

The above fourteen elements are chiefly obtained from oxygen of the air,

water, carbonic acid, oxide of iron, chlorides, silicates, magnesia, oxide of manganese.

Water is the most abundant compound in plants. It constitutes 91 parts out of 100 in fresh turnips, 90 of strawberries, 84 of apples, and 12 out of 100 of dry corn.

It holds in solution the solids, and gases to some extent, much of which are used to build up the plant.

Plants have the power of decomposing these compounds and of making new materials of them, or of re-arranging them.

Plants are made up of minute cells. Each cell wall when alive and active is composed of two coats, a thicker outer coat surrounding a delicate inner coat. In wood and bark and some other parts which split or tear into strips or strings, the cells are long, and usually tapering and overlapping at the ends. In the pulp of apples, peaches, shells of walnuts, vegetable ivory, leaves of mosses, all sea weeds and fungi and lichens, and many soft and delicate parts of plants, the cells are not more than two or three times larger in one direction than in the other. The outer cell wall, which alone remains in many mature cells, is composed of cellulose, which is found nearly pure in cells of cotton and fibers of hemp and flax.

Lignin is found with cellulose in woody fibre and hard shells of nuts, etc.

Starch is free in the cells of wheat, corn, potatoes, and many other plants. This is the form in which many plants lay up a store of nourishment for future use.

Dextrine is starch in a soluble condition.

All bodies in the cellulose group contain twelve parts of carbon, and ten, eleven, or twelve molecules of water.

Besides these there is a group of vegetable acids, as oxalic in sorrel, malic in apples, tartaric in grapes, citric in lemons.

There are fats and oils, resins and wax, containing much less oxygen than exists in the cellulose group. They are mostly composed of oxygen and hydrogen.

The albuminoids or *protein bodies* differ from the above in containing five elements instead of three. They contain fifteen to eighteen per cent of nitrogen, a little sulphur, and sometimes a small amount of phosphorus.

The albuminoids are abundant in seeds and all young growing plants. Albuminoids exist in the sap of all plants in small quantity. Such parts also contain vegetable fibrin, gluten, caseine. The exact formulæ of all these is uncertain. They are easily decomposed. They are very important in food of animals. Albumen is found nearly pure in the white of an egg.

Chlorophyll (leaf green) exists in small quantities in all parts which are green. It is in the form of granules floating in the transparent cells. Prof. Johnson thinks the quantity of chlorophyll no greater in plants than dye in colored fabrics.

The above are the materials of which plants are made. They are the bricks, lumber, lime, nails, glass, and paint of the structure. Plants alone absorb inorganic or mineral substances, which are re-arranged or assimilated. With this assimilated material new cells are formed. The plant grows.

The dreams of those who studied Liebig's writings twenty-five years ago have not been realized. As I understand it, he believed any one could analyze a handful of soil from a field, and then tell just the kind and quantity of fertilizer needed to produce any kind of crops.

An artificial soil may be made up in just the right proportions of just the right materials for any crop, and yet be absolutely sterile, because the materials are not in a condition to be absorbed by the plant.

The falsity of this notion need not seem strange to us after considering the opening sentence in Johnson's *How Crops Feed*, which reads: "A multitude of observations has demonstrated that from 95 to 99 per cent of the entire mass (weight) of agricultural plants is derived directly or indirectly from the atmosphere." This does not, of course, mean that plants feed entirely upon oxygen and nitrogen, the two chief ingredients of air, but that the air contains *nearly* all, but not *all*, the other elements in sufficient quantity to sustain plants. These are absorbed by rain and snow and dew, and brought down to the plant. So much depends upon the degrees and variations of moisture and heat and light, which are, at most, beyond our control; so little is furnished by the soil, that it leaves a large element of uncertainty as to the results after applying any particular fertilizer.

Different varieties of the same species behave differently under the same treatment.

So much depending upon the weather, we see the need of a good knowledge of meteorology as well as of chemistry and vegetable physiology.

Time and space will allow me to merely quote a table in *How Crops Feed*, page 98, giving the source of food to plants as taken from the atmosphere:

Absorbed by Plants.	{	Oxygen, by roots, flowers, ripening fruit, and by all growing parts.
		Carbonic acid, by foliage and green parts, but only in light.
		Ammonia, as carbonate, by foliage, probably at all times.
		Water, as liquid, through the roots.
		Nitrous acid } United to ammonia, and dissolved in water through the roots.
		Nitric acid }
	{	Ozone } Uncertain.
		Marsh gas }
Not absorbed	{	Nitrogen,
		Water in state of vapor.
Exhaled by Plants.	{	Oxygen, } By foliage and green parts, but only in light.
		Ozone? }
	{	Marsh gas, in traces by aquatic plants.
		Water, as vapor, at all times.
		Carbonic acid, from growing plants at all times.

Observe that buds, flowers, roots, ripening fruit, etc., give off and take in just the reverse of green leaves in light.

Although the air contains only 6 parts in 10 000 of carbonic acid, the air of the soil contains 10 to 390 times that proportion. The composition of plants changes with their growth. There is the greatest activity while flowering. They take up different proportions of certain kinds of food at different times during their growth. They require a change of diet.

The seed of plants requires more of some kinds of nourishment than the petals, stamens, or any other parts. For example: An analysis of the ash of the oat-plant shows in the lower stem, of silica 14.1, middle 9.3, upper stem 20.4, lower leaves 34, upper leaves 41.8, ears 26.0, chaff 68, husk 74.1, kernel 1.8. In an analysis of eight parts of the plant (leaving out the seed) the lower stem contains less silica. Seventy-five years ago, when silica was found in the straw of wheat and oats, the conclusion was at once drawn that it serves to stiffen the plant, and serve the purpose of bones in animals.

Johnson says: "Two circumstances, however, embarrass the unqualified acceptance of this notion." The proportion of silica is not greatest where most

is needed to agree with the theory advanced. The upper stem contains four times as much silica as the lower, and the chaff and husk about thirty-seven times as much. To make the theory have much weight, we ought to find the greatest amount of silica where there is the greatest strain.

As before mentioned, all plants are composed of one or more cells. An active, complete cell consists in a permanent cell wall lined with a delicate membrane, and within these a semi-fluid called protoplasm, containing a vast number of very small granules. In some parts of the cell may be seen a round body called the nucleus, and upon this a nucleolus.

Every fiber of cotton is a cell. These are sometimes two inches in length; but in woody tissue cells are not often over one-fifteenth of an inch long.

Elder pith is made of large cells, but it would take 100 of them side by side to reach an inch, and about 50 to reach an inch if placed end to end. In growing plants these cells are multiplied with great rapidity, each one dividing into two or four or more cells. In a puff-ball sometimes three or four millions of cells are formed in an hour.

In a very young plant of the highest classes the cells are much alike, but as they grow older the cells become more diversified in form.

In some of the simplest plants, as the yeast plant, red snow, many other fungi and minute sea weeds, each plant is a microscopic cell.

The plan of our higher plants is very simple, and consists of only root, stem, and leaf in some form or other.

If we examine a young apple tree a year old, we shall find it made up of a lot of internodes and nodes placed above each other, a node at the top of an internode bearing a leaf, which produces a bud just above it. This bud becomes a branch essentially like every other branch on the tree. The trunk, at last, is composed of the enlarged young stem. The Designer of all plants has vastly added to our enjoyment by not making all leaves alike on every plant.

Leaves appear as dry scales on buds, as thick fleshy masses on the bulb of a lily, as thick heavy leaves on century plants, as pitchers or fly traps, as spines, as tendrils. They are *simple*, as in the apple, or *compound*, as in the rose, pea, and honey locust. The parts of flowers are nothing but leaves.

Stems of plants exist in great variety. The runner of the strawberry, the slender stem of the morning glory, the stout stem of the tree, the spine of a hawthorn, the underground stem of quack grass and June grass, popularly called roots, the thickened tuber of a potato covered with buds, the stumpy cacti of Mexico, and the giant redwood of California, are good examples.

ROOTS

vary too. They are fibrous in wheat or fleshy in the peony and turnip. They are annual or they may last for years.

Roots elongate at the end only, or rather the one-sixteenth of an inch bark of the end. In our trees they expand in size by annual layers the same as the trunks and branches. The soil has much to do with the length and number of roots. In light, poor soil I find roots of June grass four feet below the surface.

People are apt to underestimate the length, amount and importance of the roots of the finer grasses, wheat, oats, etc. Some roots of clover and Indian corn are large enough to be seen by every one on slight examination. A young wheat plant, when pulled up, only shows a small part of its roots. They go down often four to six feet. It needs very careful examination to show that

clover and Indian corn have any more weight of roots than June grass. They probably do not contain more.

The roots of a two-year old peach tree in light soil were found seven feet four inches long. In dry light soil, this season, we pulled up one parsnip three feet long, and another three and a half feet long. Small roots were even longer.

The noted buffalo grass on the dry western prairies is described in the agricultural reports at Washington as having very short roots, but Mr. Felker, one of our college students, found they went down *seven feet*.

The roots grow best where the best food is to be found. They grow in greater or less quantity in every direction. If one finds good food, it flourishes and sends out numerous branches. Many of the smaller roots of trees die every autumn when the leaves die, and others grow in spring. Near a cherry tree in my yard was a rustic basket without a bottom, filled with rich soil. On removing the basket and earth, cherry roots were found in large numbers near the top of the soil. They had grown full of small branches where the soil was good. Roots in soil will grow up just as well as down.

Every wood-chopper knows that we can tell the age of trees in our climate by counting the rings or layers of wood on the stump. The cells which make up the stem are larger early in the year than they are near the close of the year or time of growth.

The stems of Indian corn and of palms do not have much wood in their structure. What they have is in the form of woody bundles or threads scattered without order throughout the stem. We cannot tell the age of a palm tree by its diameter, but can tell approximately by its height. The woody axis of a tree is a series of cones placed one over the other, like a lot of funnels, except that the last one is the longest and completely covers all the rest. We may tell the age of a young apple tree or peach tree by counting the scars left each spring where the hard bud-scales fall off. It was once thought that the heart-wood was entirely dead and served no purpose to the tree except to give it support, but later researches show that "living processes" go on to some extent in the heart wood. The growth of wood in our trees is confined entirely to the cambium, or new layer, each year.

Most flower stalks grow up, but some hang down or bend down and push themselves into the soil to ripen seeds, as do the peanut and some *polygalas* and wild beans.

Still, most, if not all, young stems grow up and the roots turn down. Various attempts to explain this on mechanical principles have all failed. We cannot tell why they grow as they do any more than we can tell why young ducks take to the water.

LEAVES

when very young appear as a little projection of one piece,—as they advance woody bundles or frame work are developed. Leaves have been called the lungs of plants. In a certain way they are a temporary stomach as well as lungs. Yet I have known a graduate in a Greek and Latin course to cut off the leaves from his grape vines to let in the sun to ripen his grapes in September. Leaves are a chemical laboratory, a factory to assimilate raw materials ready for plant fabric,—to build up all parts which grow.

Leaves put the plant in close proximity to the air and light of the sun. They regulate to some extent the escape of water, which comes up from the roots.

THE CIRCULATION OF THE SAP

is commonly given in the text books as a very simple matter which every school-boy is expected to know and understand. Late researches indicate to me that no one yet is able to give good and satisfactory reasons for all the movements of sap in plants.

At certain seasons of the year some plants are full of sap. If cut or bruised some of it runs from the wound. A majority of plants, however, will never run sap if they are tapped at any season.

The sap in a maple tree in spring acts very much as though the bark were a tight cylinder filled with water to the top. The materials dissolved in water, and all taken in by the roots, are called the crude sap. This exists only in theory, as it is at once more or less mixed with the assimilated sap.

Field and garden plants absorb most of their nourishment through their roots in the soil.

Soil-water alone does not appear to contain all the materials necessary to nourish plants, except in very rich soil. The leaves take in carbonic acid.

Some plants thrive in damp air attached to trees which may be living or dead. They receive their food in the form of air, vapor, or perhaps occasionally as a liquid.

Some of the higher plants which live in water may take their nourishment through the leaves as well as through the roots. Some of the lower water plants (sea weeds) absorb nourishment from the water by all their parts. This of course must be the case with all our one-celled plants, which are quite numerous in variety and large in numbers.

Johnson says agricultural plants take mostly *hygroscopic* water through their roots. That is a water which is not perceptible to the senses.

Rice, willows, and many other plants take freely what is called *bottom water*, or standing water. Some writers maintain that the passage of sap through plants can be satisfactorily explained on mechanical principles alone, while others as strongly maintain that it is still unexplained, and attribute the phenomena to the vitality of the plant.

Osmose is one of the mechanical principles usually urged to account for the rise of sap to the leaves. This may be briefly stated as follows: When two liquids or solutions are of different density, or have a different attraction for a porous membrane which separates them, the liquids will usually each pass through the membrane and soon mix with one another. Endosmosis "depends upon the attraction of the membrane for the two liquids" (Dalton, p. 295).

If water be one of the liquids and albumen the other substance, the water will pass through the membrane to the albumen, but no albumen will pass into the water. Other and more complete explanations are given already in Dalton's Human Physiology. *Capillary attraction* is supposed to exert much influence on the ascent of sap. This is an operation familiar to every one as exhibited in the ascent of oil in the wick of a lamp.

Unless the air is saturated with moisture much vapor is constantly passing off through the leaves. This must aid in causing water to enter the roots. Mr. Herbert Spencer has shown that the motion of plants, swaying to and fro by the wind, is a great aid in causing sap to ascend; yet, sap gets up easily enough though, when plants grow in perfectly still places.

DIFFUSION OF LIQUIDS

with each other is thought to assist in the movements of sap. Thomas Graham divided substances into *crystalloids*, such as salt, sugar, etc., and *colloids* such as starch, gum, and gelatine. Crystalloids move freely through membranes to mix with colloids, but the reverse is not the case.

There is no fact better established in vegetable physiology than this: that the sap of plants goes to the green leaves or surface of the plant and there becomes changed or re-organized into material fit to nourish the plant.

Over 100 years ago, in trees the sap was thought to go up in the young wood and descend in the cambium layer. Numerous facts seemed to prove this. A thread or wire tied closely about the tree causes a bunch or ring to form above it.

In *coniferae* (pines, spruces, cedars, larches, etc.), the wood cells are all nearly alike. There are no vessels or ducts. In such plants the sap ascends in the wood cells, passing from cell to cell through vast numbers of partitions in its course to the leaves. In all woody plants of our climate except the *coniferae*, there are numerous ducts or vessels, long tubes much larger than the wood cells. The older botanists believed (and some of the later) that sap ascends in these vessels, while *most* recent botanists believe the sap ascends through the woody tissue. The vessels are sometimes full of sap and sometimes full of air.

If a limb containing good leaves is cut off and placed in an alumed decoction of logwood or magenta, the dye will ascend more or less rapidly, according to the evaporation of the leaves. A cross section of the limb near the liquid shows all the wood cells full of colored sap and the vessels empty. A cross section higher up at a certain time shows a few wood cells full of colored water, and these are all in the form of a ring just about a vessel. Here too the vessel is empty.

Herbert Spencer concludes that the fluid goes up in the vessels and passes sideways to the woody tissue. The mechanical and physical forces mentioned probably aid in the circulation or movement of the sap, but they alone do not seem to satisfactorily explain the whole subject. In petals, for example, or any parts of the flower or leaves which are not green, I have hundreds of times noticed under the microscope that some of the cells may be filled with a clear liquid, and others next to them, separated only by a cell wall, are filled with a liquid which may be deep blue or red or violet. How is this if sap is under the control of osmose? More than this, orange-colored flowers appear so because some cells are full of a red fluid while the cells next to them are full of a yellow fluid. How can we explain the fact that liquids pass up and down long drooping branches of elms and willows?

In the turnip and beet the crude sap goes from the roots to the leaves, and then some of the nourishment goes back to thicken the root, which stores up food for future use, as a bear gets fat in autumn and lives on fat all winter. In spring the nourishment in the root of the turnip goes again into the stem and leaves above. By culture and selection a wild, worthless plant on the coasts of Britain has changed into several forms, and is now known as cabbage, kale, broccoli, Brussels-sprouts, cauliflower and kohl-rabi. In the cabbage the nourishment is partly stored in the stem, but largely in the leaves; in Brussels-sprouts, in the buds or branches; in cauliflower, the flower stems; in kohl-rabi, the stem is gorged with food. Here the same species is made to

take on several different forms, by using different parts as a storehouse of food for future use.

In different plants we find nourishment stored away in parts which are commonly used for other purposes. The storehouse is in the leaves of the century plant. In fruits and seeds, we find it now in the cotyledons of beans and peas, in the albumen of buckwheat and corn, in the calyx of the apple and winter-green berry, in the top of the flower-stalk in the strawberry, in flowers, leaves, and stem of the pineapple. It looks to me as though there was some mysterious faculty or unknown quality in plants which we have not begun to understand. Cut off a branch covered with leaves and insert the top end in a liquid, and the water goes freely in the opposite direction to its usual course. Trees have been pulled up, the tops buried, and roots left in the air. In this inverted condition, leaves and buds have grown from the roots in air, and roots have grown on branches in the ground, the trunk serving as a medium either end up.

Sap rises often when there are no leaves on the plant. The wood of the maple is gorged with sap before the leaves are developed in spring, when the entire surface of the trunk is covered with dry bark and bud-scales. Cut the tree on a cold day and no sap comes forth; cut the tree in bright, warm sunshine of March, and it flows rapidly. The latter phenomena are explained by supposing that minute particles of air in the cells contract in the cold and expand by heat, forcing the sap to rise higher or escape from a wound in the bark. The escape of water from the leaves is not necessary for the growth of plants. They often grow most rapidly when the air is saturated with moisture, as on rainy days, and when plants are confined in a Wardian case.

Quite recently President Clarke and the rest of the Faculty of Massachusetts Agricultural College, have made some very valuable experiments on the circulation of sap in plants. I can here only refer to a few of them. Of the trees or plants which produce a flow of sap when cut, "each species has its own time of beginning," and running its course till it ceases for the time.

Sap flows slower and with less force as we go up the tree. Some of President Clarke's experiments showed that a maple tree will run twice as much sap when tapped on the north side. He has since found that, in most cases, maples produce most sap when tapped on the south side. When sap is running insert a gauge in one side of a tree to indicate the pressure; tap the other side and immediately the gauge indicates a lower pressure. Closing the hole, in ten minutes the gauge rose again to its former level, by re-absorption from the roots. A tall maple tapped in the top did not flow a drop; half way down the pressure was half as great as near the ground.

A gauge in cold weather in spring indicated a suction equal to a 25.95 feet of water: as the sun came out it changed till it represented a pressure of water 44 feet high. On May 4th a birch tree showed a pressure of water equal to 84.77 feet in height. A birch root, on April 30th, an inch in diameter, a foot under the cold soil, shaded by trees and leaves and on the northern slope, lying in a horizontal position, was cut off from the tree and a gauge attached to it. At noon the gauge showed the enormous pressure of 85.80 feet of water. "This wonderful result showed that the absorbing power of living birch rootlets, without the aid of the numerous helps imposed upon them by ingenious philosophers, such as osmose, exhalation, dilatation, contraction, oscillation, capillarity, etc., etc., was quite sufficient to account for the most essential of the curious phenomena connected with the circulation of the sap."

"In conclusion," says President Clarke, "we may as well admit that life is

still a special force, and not to be resolved into any other sort or combination of attractions or repulsions, whether called electricity, osmose, or any other name."

In an excellent Manual of Botany recently published by Robert Brown in England, he says, "the cause of the ascent of the sap is by no means placed beyond a doubt." The eminent German, Hugo von Mohl, one of the best of authorities who has investigated these subjects, places the circulation of sap among the unsolved questions.

It is, and always has been thought to be, more difficult to explain the descent than the rise of sap, and yet our students are asked by our county superintendents of schools to explain the circulation of sap in plants, and Wood in his text-book, extensively used in our schools, is supposed to explain it fully in about half a dozen pages.

RESPIRATION.

As was shown by the table, oxygen is given off in the light by foliage and all green parts of plants. Carbonic acid (CO_2) is decomposed, the carbon retained and the oxygen given back to the air. By this process plants are taking up what is given off by animals and what is deleterious to them; they give off oxygen, which animals must have for breathing. This is only one of the points in which plants and animals mutually aid each other. This is the beautiful "compensation" notion referred to last evening by Mr. George Parmelee. It is not yet exploded, although as before stated and shown on the chart, certain parts give off carbonic acid, and the leaves allow some to run to waste, or go back to the air at night.

There is no fact better established in the growth of plants than this: that plants take in carbonic acid by their leaves, decompose it in the light, retaining the carbon and giving off oxygen. *Less carbonic acid is given off by healthy growing plants than is absorbed.* This is beyond controversy.

Fungi, that is toad-stools, puff balls, moulds, and the like, are plants which do nothing,—or assimilate nothing,—but only use that which other plants have collected from the mineral world. They are scavengers,—parasitic in one sense.

THE EVAPORATION

of moisture from the leaves is well known. It passes off in large quantities from growing plants, at all times, in air not saturated with moisture.

In the greenhouse at the Agricultural College, thrifty plants of the *colocasia*, or *caladium*, a common, large-leaved plant, have often been seen to give off water in little drops, coming from a small hole at the end of the leaf. The water comes into two little veins, one along each side of the leaf, and finally meets at the top, where the drops may be seen to escape with a little force. Other plants have been found to do the same thing. The water has never been analyzed to my knowledge. This is not new. Several pitcher plants secrete a liquid in their pitchers and drown insects, of which they make a rich liquid manure. The plants are especially contrived for catching insects by stiff hairs pointing down. Some of them secrete a sweet substance about the mouth of the pitcher to entice the flies and bugs into the fatal pit, where they are drowned and eaten up by the plant.

Herbert Spencer thinks he has discovered some apparatus in the leaves to serve as glands to collect the assimilated sap and then return it to the parts below. How the sap is assimilated in the leaves no one pretends to know.

GYRATION OF SAP IN CELLS.

In certain cells of many kinds of plants, under the microscope, the sap, with floating granules, is seen to slowly pass around the sides of the cell like an uneasy animal trying to escape from a yard. No satisfactory cause has been given for this circulation. I have watched it for hours without perceiving that any of the sap passed out or into the different cells.

GERMINATION

is called a growth in one sense. Seeds when moistened, exposed to the air and a certain amount of heat, germinate. Some seeds will germinate near the freezing point, while the most favorable temperature for growth of seeds of wheat is 80°, corn and squash 93°, cocoanut 120°. The germinating seeds assimilate nothing for a while, but live on matter within or next to the embryo, matter which was deposited there by the parent plant. By the time this is used up, like the chickens just hatched, they are ready to go alone, and begin to work for themselves. Sprouting of potatoes in spring in the cellar is a growth which takes place at the expense of food stored up the year before.

Plants need a season of rest from growth. If a lilac or rosebush, or apple tree, or grape vine, be watered and warmed and fed continually, it will become diseased and die in a few years. That plants have a season of rest is often if not always true the world over. Flowering, and especially seeding, is an exhaustive process to all plants. If not allowed to flower or produce seeds, they will become stronger and less inclined to die. Mignonette and many other annuals so treated will become perennials.

All the higher plants produce seeds after a process of

FERTILIZATION.

There are occasionally exceptions for a generation or two, but probably not for many years. In almost all the lower plants,—the ferns, the mosses and lichens on the old logs, rocks and fences, the shining green water plants of the frog pond, the rust, smut, mildew and mould (which are plants), have nearly all been found to have something answering to stamens and pistils, or some kind of fertilization.

Some low water plants occasionally come in contact with each other; the contents of two separate cells meet and make only one new cell; this grows and branches by division for a time, when the conjugation of cells again occurs.

Desmids (water plants of single cells, found in our ponds) grow by division. They also produce spores, answering to seeds, but occasionally—once a year, perhaps—comes this blending of two cells to make one, called a kind of fertilization.

MODES OF FERTILIZATION IN HIGHER PLANTS.

Intimately connected with this subject of plant growth is that of the manner in which this is brought about in different plants.

One of our plants, *smilax*, has such a stinking odor that blow flies lay their eggs on it, probably deceived, thinking it to be carrion. In this visit the fly carries the pollen from flower to flower. The agency of wind and insects in fertilizing plants is a fascinating subject for two long lectures.

Flowers are furnished with nectar and gay colors to attract insects, which are well paid for their visits. The ingenious contrivances by which insects are made to serve plants in crossing them is wonderful. "Where free lunches are

provided, some advantage is generally expected from the treat." The above quotation some of you may be familiar with : I am not.

NATURE IS LAVISH.

If a plant is contrived with underground flowers, like our wild violets, which bear seeds all summer, but little pollen is formed to fertilize each flower ; but there is enough. If insects are to aid, we find more pollen, and if the fickle wind is the chief agent, we often find vast quantities (34,000,000 grains in a conifer, perhaps) for each seed. Nature is lavish with her treasures. All of our trees and shrubs start with more young seeds (ovules) than they usually ripen. The cherry, the peach, the plum, have two in each pit, but seldom ripen but one. The oak, chestnut, and horse-chestnut have three cells with two ovules in each,—six ovules where one seed generally ripens. The bass-wood has five cells, with two ovules in a cell,—ten ovules to ripen but one seed. So all over the animal world there is a wise provision made for many failures.

In growth of plants there is

ORDER AND DESIGN.

There is design in the array of fractions which express the arrangement of leaves and buds and flowers on the stem, in the way the different parts of a flower are arranged with reference to the other parts, or the leaf near which they grow. There is order in the way in which leaves are packed away in the bud, as well as the manner in which they hang from the tree. There is order in the arrangement of the seeds in the pistil, and in the bursting of the pistils to distribute the seeds. Plants grow to produce seeds, which are to keep up a succession.

THE MOTIONS

of plants is a theme of much interest, and for some years have attracted considerable attention. I will only mention one or two. The *drosera*, or sun-dew of our marshes, is a small plant with leaves covered with sensitive hairs, which have sticky glands at the ends. These move towards and catch small flies, which they then proceed to digest and use up. I have seen eighteen small flies caught on one leaf no larger than a cent. Another foreign plant has two small leaflets and one large one. The two small leaflets keep up, in warm weather, alternate, jerking motions, perhaps to scare off the flies,—nobody knows. The sorrel, and locust, and many plants, change the shape of their leaves at night. A grape vine or hop vine climbs above the top of a post, then tips over and swings clear around and around, sometimes making a complete revolution once in two hours. I have seen a hop vine go up over four feet before tipping over. Some plants swing around one way, some the other, and some are indifferent. These are all matters worthy of study.

LIMITS OF GRAFTING.

You all know that we can only graft successfully plants which are closely related,—plants which at least belong to the same natural order, as the pear on quince or thorn. I know of some large stumps of horse-chestnut trees which an ignorant gardener spoiled by trying to make scions of chestnuts grow in them. The name chestnut deceived him : he had no idea the plants were not related, and not of the same natural order. He lived near neighbor to J. J. Thomas, too, showing that one person will not necessarily absorb information by living near another who happens to be well informed.

WHEAT TURNING TO CHESS.

I will close with one more example. A year or two ago the editors of a western paper sent me a specimen which was sent them. It was a small stalk of chess with seeds upon it, and on one of its roots was the remains of an old kernel of wheat. The person who sent it says: "Here is certain evidence that wheat turns to chess: there is no theory this time, for here is the bearing chess plant, and there below is the old wheat shell from whence grew the chess." Now here comes in one case where some knowledge of the ways in which plants grow, is of value. Wheat, corn, chess, oats, barley, and many other plants, are *monocotyledonous*. From the seed bursts out a very short, stumpy swelling called the *radicle*. The radicle becomes quite long in the common bean and pumpkin vine, and raises the seed leaves out of the ground; but in wheat, and the large class to which it belongs, this radicle remains very short,—not more, probably, than the eighth of an inch long. From the end, in three or more places, burst out some fibrous roots. Such plants never have tap roots, which I have heard theorists talk about,—self-styled practical men. If this specimen spoken of grew from wheat, it must have several little roots close to it, or coming from it, and the stem going above it to the surface. I placed the specimen in a saucer of warm water and left it over night. The next morning the part looking like a wheat kernel had separated from the root. I placed it under a microscope: it was the skin or bran of an old wheat kernel which a root from the chess plant had grown into after the little nourishment which might be left there. In hunting for plants during my life, I suppose I have twenty times pulled up a plant which had thrust one root into a small snail shell; but I never supposed for a moment that the snail had turned to a root which had produced the plant.

It is an easy matter in almost every case to find the old chess kernel from which grew the stem above ground. Dig up some of them and gently wash them: then look with care. Good looking, good eyes, and a knowledge of how to use them, are a great help to any one.

SIGNAL SERVICE.

BY R. F. KEDZIE, METEOROLOGIST OF THE SOCIETY.

A division of the Signal Service Bureau was established a few years ago by the general government for the ostensible object of benefiting commerce and agriculture. The object of this bureau seemed to be a most laudable one, when we reflected that if the sailor could have a few hours' warning of a terrible storm of wind, he could make all snug above and below and bid defiance to any tempest; and that the farmer and fruit grower, seeing the signal of danger, could save at least a portion of his crops from destruction and loss. Then it seemed as if the millennium had come for farmers and pomologists. We shall suffer no more from loss of fruit by frost, for forewarned is forearmed. No more loss by rain, for we shall be warned in season, and our crops shall be housed in safety; and from the State Agricultural College, and from other agricultural colleges all over the land, petitions were sent to Congress, praying that the Signal Service be established.

As the Signal Service has been in active operation for several years, let us see how well it is doing the work it started out to do. The value of this office to commerce is very great. By the display of bulletin reports, of reports at the river stations giving the rise and fall of rivers, of large weather maps, and last but not least, by the display of day or night signals at designated stations, on occasions of supposed especial danger, many a ship has been warned of the threatened storm, and lay snugly in harbor, when to have ventured out on sea or lake would have been followed by damage to the vessel, or even the loss of the vessel itself. All honor, then, to the government for reaching out its protecting hand to those "who go down to the sea in ships, who do business in great waters."

But the Signal Service was not designed for the protection of commerce only, but also for the benefit of agriculture. To be sure, we receive daily prognostics concerning the weather, but the weather has done its worst and gone before these reports are received. We have also five signal stations in this State, viz: Detroit, Grand Haven, Marquette, Escanaba, and Alpena. But as far as the benefit to agriculture is concerned, these observers might as well be on the top of Mt. Washington. The Signal Service seems to have turned a deaf ear to the interests of the farmer and fruit grower, and while sparing no pains to protect our shipping, has overlooked our corn-fields and orchards. That the interests of the farmer and pomologist are as important as those of the sailor, will be readily conceded. When we remember that the capital in-

vested in farms is to the capital invested in vessels as a thousand to one, it will at once be seen that if timely warning could be given of the approach of storms that thousands of dollars could be save to this State alone.

Of the extent and severity of a storm, we can have but a feeble idea because it is unseen. It comes in a wave of cold air, blasting fruit buds and fruit trees, and is gone before we can protect our trees from its chilling blight. You remember the Mill River disaster,—how the deacon mounted his horse, and galloped down that valley of death, giving warning to the inhabitants that the reservoir would soon give way, and the fearful volume of water would carry every thing before it. But that body of water went only at the rate of twenty miles per hour. How feeble a thing compared with a storm! Here we have storms extending over a vast extent of country, and proceeding at the rate of a hundred miles an hour, when it comes in all its terrible reality and spreads like a great cloud over the land, destroying the prospects of many a farmer, who, struggling with poverty and sickness to eke out a scanty subsistence, sees the result of his year's toil offered up to the insatiable appetite of the elements. Thrice terrible when we know that had he been warned of the coming danger, a portion of the crops at least might have been saved. The cold winter storms which do so much damage to fruit, are usually formed in the wilds of Dakota, that desolate region cursed with Indians, grasshoppers, and Jay Cooke's Northern Pacific Railroad. Thence coming down upon us like a vast polar current, it nips our fruit buds, and compels us to bid farewell to many of our most delicious fruits.

The Signal Service officer is in telegraphic communication with all parts of our country. By noting the temperature, and watching the fluctuations of the barometer, he is enabled to know the severity of storms, and the direction in which they will proceed. If signal stations could be established in various parts of our State, and some signal given of the approach of a storm, such as the raising of a flag, or the firing of cannon, a portion of the crops could be gathered, at least.

As an example of what may be done for protection of fruits, we will cite a single case. In France, when danger is feared from frost, fires of coal tar are built around the vineyards, and the smoke floating above them entirely prevents the formation of frost. If in this country we were *warned* of the coming of frost, might not similar means be tried, and with similar results?

In looking over the past, what a sad history is presented of the waste of farm productions which might have been prevented by proper foresight. In the year 1857, after the wheat was cut and in the shock, several days of rainy weather caused the grain to sprout, and the wheat was so utterly ruined that the housewife said that "she had to shut not only the oven door, but the doors of the house also, to prevent the bread from running out into the yard." During one fall, a few years ago, while the trees were loaded with apples, there was a sudden change in the weather, a few inches of snow fell, and the consequence was, that the apple crop of this section was almost an entire failure. The signal officer was probably aware of the coming of this storm, and with signals of warning given at different stations in our State, almost the entire crop might have been saved.

Many attempts have been made by the people of this State to have signal offices established, and have failed. The Agricultural College offered the services of a telegraph operator, gratis, if the government would establish a signal station there. The signal officer replied, very curtly, that they had received

hundreds of applications of the same character, and showed very plainly, by the spirit of his reply, his total indifference in the matter.

. In view of these, and many other facts which time does not permit us to state, I offer the following resolution :

Resolved, That the State Pomological Society memorialize the Legislature of this State, to pass a joint resolution requesting our Senators and Representatives in Congress to so extend the scope of the Signal Service as to give the benefits of the Signal Service to agriculture in the following particulars: First, during the period of active operation in agriculture (April to November) to give warning, by telegraph at every telegraphic station in the country, of the approach of storms and of their probable severity; also of the approach of waves of cold, their central path, and their probable extent and severity.

The resolution was adopted by a unanimous vote of the Society.

ECONOMIC ENTOMOLOGY.

ITS HISTORY, PROGRESS, AND NEEDS IN THE UNITED STATES.

BY PROF. A. J. COOK, OF THE STATE AGRICULTURAL COLLEGE.

A few years ago that speaker or writer who should be bold enough to even mention seriously that science might and ought to be applied to advance the practical arts, would not only have been held in derision by the unlettered and practical folk, but even his brother scientists would have regarded him as an unworthy member of their fraternity. The practical man held—as many hold even to-day—that the idea of applied science was absurd, while the student of science maintained that his pursuit was by far too exalted to stoop to the ignoble work of ministering to mere human desire. But it is my happy privilege to record a very great and rapidly growing change in the opinion of both the above classes. The leaven of our Christianity has worked in the hearts of our scientists, and they feel that the noblest of all work is to lighten the burdens of weary humanity; that while all truth is precious, that truth which elevates the condition of our fellow man is glorious. On the other hand, the geological erudition of Murchison, who revealed the vast hidden treasures of Australia; the researches of Prof. Coste, which established the extensive business of oyster-planting, leading to the conversion of whole shores of waste acreage into most profitable plantations; the valuable truths elicited by the noted Pasteur, who not only discovered the cause, but also a preventive of the terrible pebrine, which threatened the total ruin of silk manufacture, by the extermination of the silk-worm; not to mention the more familiar cases of Franklin, Morse, Farraday, and,—to come to our own science,—the many practical discoveries in economic entomology, which enable us to feast upon the bounties of nature in lieu of yielding up her most priceless blessings to the hordes of eager insects ever present to snatch them from us—all these results make the wise producer,—the far-seeing laboring man,—no longer to ignore scientific research, or to doubt its practical benefits, but rather to acknowledge its vast importance, and give it all possible aid, that they may reap the fullest rewards from its most perfect accomplishments. Add to this the fact that each year records enormous losses, and often deplorable suffering, as at the present time, through the ravages of the chinch-bug and locust, along our western prairies, from a foe, before which the farmer and fruit-grower are all powerless, and we can easily understand why it is that there is an increased

and growing appreciation of the benefits of applied entomology. Thus it is— noting that economic science is rapidly growing into *appreciative* favor among all classes,—that it is no unwelcome labor to comply with the request of the officers of this society and consider the history, progress and needs of the special branch with which I am most interested.

You will be surprised to learn that while those animals which claim the attention of the entomologist—the insects—far outnumber all other animals, and that while their consideration has been so extensive that Dr. Hagen, who has published the names of the authors and articles treating of them, had to employ two large volumes for the purpose, and that while their injuries are *so* patent, *so* extensive, and *so* difficult to understand and to guard against, that, especially in this country of agriculture, which bids fair to become the world's great granary, you may easily count on your fingers all those who have done real earnest, telling work in economic entomology. The first person to engage in this important work labored so nobly and so well that, though the pioneer, he has scarce had his peer in this or any other country. I refer to Dr. Thaddeus Wm. Harris. Says an eminent American botanist, in speaking of this great man: "Of other genuine naturalists I have read, but he is the only one I ever knew." It is said that Dr. Harris' father composed for Mr. Everett's youthful recitation the familiar lines:

"You'd scarce expect one of my age
To speak in public on the stage,"

which might be thus parodied in reference to his distinguished son:

"You'd not expect one in that age
To glean so well from nature's page."

Dr. Harris' indefatigable labor and untiring energy will be better understood when we remember that, in addition to his extensive duties as librarian of Harvard College and voluntary lecturer in natural history in the same institution (and it is an interesting item of history, recorded by T. W. Higginson, that this was the only instruction given at Harvard College in natural history from 1837 to 1842), he copied the works of those authors which he must have, but which he was too poor to possess. Says T. W. Higginson, one of Dr. Harris' pupils, in referring to this "immense preliminary labor:" "The saying of Rivarol that 'genius is only patience,' never had a better illustration." Higginson thus speaks of Dr. Harris' enthusiasm, which, very like, was more due to the fascinating subject-matter than to the man: "Dr. Harris was so simple and eager, his tall, spare form and thin face took on such a glow and freshness, he dwelt so lovingly on antennæ and tarsi, and handled so fondly his little insect-martyrs, that it was enough to make one love this study for life, beyond all branches of natural science, and I am sure that it had that effect on me."

What better shows the lack of respect for scientific study at that time than Dr. Harris' own words, penned in 1839, in a letter congratulating Mr. Doubleday, a noted entomologist of England, and superintendent of the British Museum, "As not having to work by stealth, feeling all the time that if discovered you will be exposed to the ridicule and contempt of those who can not perceive in such pursuits any practical and useful results."

Dr. Harris' great work, "Insects Injurious to Vegetation," first published in 1841, and now published by Orange, Judd & Co. of New York, is truly a model, being thoroughly scientific, yet so clear and explicit that the most unscientific read it with eagerness and delight. I regard this treatise of such inestim-

able value that I do not hesitate to urge every fruit grower to add it to his library, for all will concede that it is incomparable in the direction of economic entomology.

For this volume, which has saved millions to our country, and which has been received with enthusiasm in all the countries of Europe, and which is an imperishable honor to Massachusetts, Dr. Harris received the sum of \$175.00.

It will never cease to be a subject of regret, to all who desire the promotion of science, and especially science as related to practical life, and most of all to the citizens of Massachusetts, that science could not have had the exclusive attention of so gifted a naturalist. And I feel more than certain that when you come to know the importance of his labors, you will not think I have dwelt too long on this part of my subject.

The next name which deserves mention is that of Dr. Asa Fitch, so long State Entomologist of New York, whose valuable reports from 1855 to 1861 form, perhaps, the most important part of the very excellent agricultural reports of the Empire State. Especially the early reports of this able and justly celebrated worker, are of exceeding value, as exemplified by the remarks of competent judges, that they saved annually to that State alone the sum of \$50,000. Surely Dr. Fitch's appointment was not very bad economy, as his salary was never more than \$1,000. It is much to be regretted that Dr. Fitch's age and strength did not permit a continuance of the good work, and it is greatly to be hoped that the great commonwealth will soon find a worthy successor.

These reports are very full in their discussion of injurious and beneficial species, afford us very clear descriptions of those insects which we shall have most to battle, and are not without most valuable suggestions as to the best means to wage a successful warfare against our worst insect enemies.

These reports, as issued by themselves, were in such demand that it is exceedingly difficult to procure copies, but they are given in the transactions of the Agricultural Society, and of themselves are of sufficient value to warrant great effort by Agriculturists and Pomologists in securing these reports.

Dr. Fitch, by his most patient and pains-taking experiments, has developed many new facts in reference to insects already known and described, has discovered several new enemies, giving details as to their history and habits, and many parasites and predaceous insects, those best friends of the Agriculturist.

I am happy to state that Dr. Fitch, like Dr. Harris before him, was quick to *appreciate* the valuable services of the birds, not withholding the just meed of praise from even the robin, blackbird, or crow, for too well did he know their surpassing worth as abettors in the work of insect extermination. Very likely his influence led to the appointment of the Committee on Ornithology by the Horticultural Society of his State, a feature we might well imitate.

The next person deserving of mention in this history is the lamented B. D. Walsh, State Entomologist of Illinois. Dr. Walsh was not only a very able scientist (my respected friend and teacher, the distinguished Dr. H. Hagen of Harvard University, once told me that he had met no more able entomologist in the United States than Dr. Walsh) but was so utilitarian in his ideas, that practicality shone in and through all his vast knowledge and able researches. His ex-centric style, plain, outspoken manner, and trenchant wit, secured the popular attention no less than that of the scholar. I well remember how, at an entertainment in Chicago, where were gathered many of the ablest scientists of the land, that he seemed the very center of attraction. Dr. Walsh, in common

with every true scientist, hated all pretension, and was in every respect thoroughly honest and genuine.

Many of our worst insect enemies were first described by Dr. Walsh, and by careful and persistent experimentation, he discovered, and freely gave to the world many of our most valuable remedies.

The safety with which the true scientist may prophesy, is well illustrated in many of Dr. Walsh's articles, as for instance, his predictions in reference to the new potato beetle (*Doryphora 10-lineata*, Say), and hateful grasshopper (*Caloptenus spretus*, Uhler), which time has fully verified.

Dr. Walsh was about the only entomologist I have ever known, who failed to appreciate the good wrought by birds. I have sometimes wondered if the loss of some favorite fruit during the earnest period of childhood combined with the proverbial "stick-to-it-iveness" of English prejudice, might not account for this eccentricity.

Dr. Walsh was assistant editor of the first volume, and sole editor of the second volume of the Practical Entomologist, published by the Entomological Society for the years 1866-7. He was also associated with Prof. Riley as editor of the American Entomologist, in 1868-69-70, up to the time of the sad accident which bequeathed such a severe loss to our country. He also issued a valuable report during his first year as State Entomologist of Illinois. I most earnestly recommend that all our Michigan fruit growers become possessors of these several volumes, which I can assure you, you will find unsurpassed in practical value, and so entertaining that they will attract and stimulate your *children* to observation, and help to beget a taste for nature which will prove invaluable.

Dr. Walsh's re-appointment as State Entomologist of Illinois, with a salary of \$2,000, together with the speedy appointment of a successor, after his lamented death, is also significant of the good work he did in practical entomology.

The next name for consideration is no stranger to you, for Prof. Riley's good work has been richly appreciated by every thoroughly-informed husbandman in our country. Prof. Riley labors with great advantage, in that his able pen is greatly aided by the truthful delineations of a no less skillful pencil, and not only for his zeal and energy in pushing entomological investigations, but also for his faithful illustrations, he justly merits the gratitude of us all.

Prof. Riley was the first to describe and unravel the history and transformations of many of our most destructive insect foes, as instanced by the climbing cut-worm, so destructive along our western coast. He has also worked up the history of a little moth, not only new to science, but of new generic characters: *Pronuba Yuccasella*, Riley, on which several of our beautiful *Yuccas* seem absolutely dependent for fertilization, and which adds another chapter to that wonderful story of inter-dependence between flowers and insects commenced by the renowned Sprengel and so ably continued by Darwin and others. Prof. Riley has also studied up the curious history of that terrible scourge of Europe the grape *Phylloxera*: the *Phylloxera vastatrix*, proving, as I think, though not satisfactorily to Prof. Glover, that the leaf and root lice are identical, and that the insect so destructive in Europe is a native American, which, fortunately for us, goes abroad to wreak its worst injuries. Prof. Riley's study of this insect demanded a journey to Europe, and for his valuable discoveries he has received not only the praise of Europeans, but French societies have openly voted him thanks, while the Minister of Agriculture and

Commerce has bestowed upon him a gold medal in appreciation of discoveries made in economic entomology. As stated in the letter conveying the information to Prof. Riley, this well deserved compliment is proof that his talents and labor are recognized by very high and competent judges.

For the past six years Prof. Riley has been doing most admirable and telling work as State Entomologist of Missouri, and his continuance in office for all this time with a salary of \$3,000, no less than the vehement protests called forth from all quarters when the governor, in a fit of false economy, recommended a year ago the discontinuance of his office, show full well that honor may come even from one's own country.

Prof. Riley first came into notice as the able entomological editor of the *Prairie Farmer*, while his various articles as assistant editor of the *American Entomologist*, added essentially to the exceeding value of that periodical, which I once heard the editor of the *American Agriculturist* commend as a model journal. Prof. Riley's six reports, as entomologist of Missouri, so well and completely illustrated, form almost a cyclopedia in economic entomology, and will prove an enduring monument to the wisdom of that State. These reports are published not only in pamphlet form, but are embraced in the agricultural reports of that State, and should be found in the library of each member of this association.

Illinois, fully *appreciating* the loss which she had incurred in the death of Dr. Walsh, at once endeavored to fill his place, and was so fortunate as to select for his successor the present able entomologist of that State, Dr. Wm. LeBaron, who, by his exact observation, careful statements, painstaking labor, and striking modesty, reminds one of Dr. Harris. Especially to be commended is his simple, direct method of stating his points. Dr. LeBaron has made some valuable additions to entomological knowledge, as for instance the discovery of a minute chalcid parasite (*Aphelinus mitilaspidis*, *Le Baron*) upon the apple tree bark-louse (*Aspidiotus conchiformis*, *Ganelin*), as also the means of transporting this valuable destroyer, that it may be introduced, and its benefits gained by every locality. And the discovery of an improved method of fighting the canker-worm (*Anisopteryx vernata*, *Peck*), which is very opportune for us, in whose State this insect has done no inconsiderable damage during the past season.

Dr. LeBaron has now issued four valuable reports, which compare favorably with those already mentioned. It is greatly to be desired that neither accident nor other circumstance will remove this second able State Entomologist of Illinois from the field of economic entomology, all so white for the harvest.

We next speak of Dr. A. S. Packard, one of the able editors of the *American Naturalist*, and author of our best hand-book in entomology, "*Guide to the Study of Insects*." While Dr. Packard occupies a first place among the workers in scientific entomology in our country, he still has done good work in applying the science. His three reports as Entomologist of Massachusetts, though unpretentious in size, are quite meritorious.

I have been frequently asked what book a person should procure who wished to commence the pursuit of this fascinating science in real earnest. To those who wish not merely to learn the practical part, but who desire to lay hold of the very foundations of the science, there is no American work comparable with Packard's "*Guide*."

This history would be far from complete were I to omit mention of the enthusiastic entomologist of the Agricultural department at Washington: Mr.

Townsend Glover. This indefatigable worker has not only described, but very fully illustrated, many of our most dreaded insect foes, drawing not only the insect but the plant or part of the plant liable to *attack*, and what is more surprising, he has done all his own drawing and engraving. It is to be deeply regretted that the Department of Agriculture, so busy in distributing noxious insects through its often worthless seeds (for several of the most injurious insects in our college cabinet I am thus indebted to the Department of Agriculture) can not set in motion those blocks so beautifully engraved which remain idly corded in Mr. Glover's study, and which are so full of promise.

The various societies of our country, agricultural and horticultural, are also doing good work in this direction, developing new truths through the careful observation of their many intelligent workers, and especially disseminating the information already gleaned by others. It is gratifying to receive so many evidences that our own society takes high rank in this respect, as it has received high and deserving praise for this part of its work.

Our Agricultural Colleges, too, are doing their part in this direction. Both Iowa and our own college have special professors of entomology, while entomology appears in the course of several others. In these colleges the practical bearing of entomology receives, of course, a generous share of attention. In our college all students who pursue the course spend nearly a half year in this study, which, of course, includes scientific and practical apiculture. In the museum there is first, a faunal collection of our State; secondly, a scientific collection, containing one species for each genus; and thirdly, a practical collection, containing plainly labeled specimens of both our injurious and beneficial species, the label also denoting where and how each works its injuries or benefits. These specimens are always open to inspection, not only by our students, but also by *all* who are interested in the subject. It is the desire too to conduct the apiary in the most scientific and approved manner, and all the students are brought personally to engage in the various manipulations required in successful bee-keeping. As a proof that these colleges are able exponents in this important work, I am most happy to relate that during the past year three of the graduates of our college have published quite extensive reports on this subject, two others have lectured several times before farmer's clubs, which lectures were afterward published in the local papers, while still another occupied the position as entomologist of the orchard committee, sent out by this society. And yet another of our students was employed to take sole possession of one of the most extensive apiaries in the United States.

Having thus treated so fully of the history of economic entomology in our country, it is hardly necessary to consider its progress, as gratifying progress is implied in the history. When we remember the lack of means, sympathy, and appreciation received by the great pioneer (Dr. Harris), and then consider that to-day several States have live, active entomologists, well supported and appreciated; that several of our agricultural colleges are forming a very hot-bed for the growth and nourishment of the science and its application; that the practical entomology of the United States has already quite a library, though the work of but a few earnest students; that our agricultural and horticultural press are fully alive to our needs in this direction, and last but by no means least, that societies all over our land, composed of energetic, practical, intelligent men, are giving earnest heed to the subject, surely we need nothing further to assure us that the lever of self-interest is already at work, and has thus early begotten a considerable progress, which bespeaks far better and more telling labor in future.

We next come to the practical part of a *most* practical subject: the needs of economic entomology. The first need of which we shall speak is that of purely scientific investigation; a need which entomology shares with chemistry, botany,—in fact, with all the sciences. It was this need that the immortal Agassiz advocated so eloquently, and with such telling effect as to lead to the establishment, maintenance, and wondrous growth of the great Agassiz Museum, and to the founding by private enterprise of the school on Penikese Island. And who shall say but that his eloquent appeal in behalf of scientific research in the beautiful city of the Golden Gate led to the munificent bequests of Mr. James Lick?

How earnestly, too, did Prof. Tindall urge bequests in this same direction in his last address in America, and how well did he show his faith by his works, in devoting the large amount acquired by his lecturing tour in this country entirely to the promotion of what he so eloquently advocated.

So great is the lack in this direction that many of our most common objects have never yet been fully investigated. That most common of all animals, the house-fly, though found in all countries, and though so well known as an imago, never had its life-history fully investigated till about a year since, the offering of the "Walker Prize" for its fullest and ablest investigation called forth from Dr. Packard a very complete monograph of its development, history, transformations and habits. Prof. Riley has been teaching for several years that the common cotton-worm moth (*Anomis xyliua*, Say), that terrible scourge of our southern States, hibernated in those regions during the winter as an imago or moth. Mr. A. R. Grate, one of our first scientific entomologists, having observed for several years in Alabama, states that the moth can not endure so rigid a climate as that of the cotton States; that they all die off, and each year suffers from a fresh immigration from regions further south. If ignorance and doubt are so apparent among the most common and familiar insects, what shall we say of the thousands which are never seen or dreamed of,—though often working the most dire injuries—except by the eager, observing entomologist. Hence we see that both field work and work in the study are crying aloud for laborers. In respect to scientific investigation we are far behind France, Germany, and even England, where the most able and experienced scientists are employed by government to the almost exclusive work of original investigation in science; and could our governments, state and national, be certain of obtaining the right men, they could adopt no wiser policy than that of keeping them engaged in just such important labor, for only as the results of such labor shall we know the nature of "yellows," blight, scab, etc., etc. Short-sighted indeed are those agricultural writers and others who scoff at the Bussey Institute and agricultural department of Yale College, even though no student should ever darken the halls of either institution, so long as the able professors continue in such important investigations as at present engage their attention.

Personal observation and careful experiments by the most scientific and cultured entomologists is a most pressing need, and that, too, right here in our own State. The first demands visits, for the purpose of investigation, to every part of the State, so that when Mr. Bidwell writes of a new borer attacking the peach trees in South Haven, Mr. Wm. Strong of the apples being severely attacked by a caterpillar in Kalamazoo, Mr. Sleeper of a new weevil attacking the plum at Galesburg, Mr. Drew of whole orchards succumbing to a new measuring caterpillar in Oakland, the several cases may receive the most able

diagnoses, and that at once. These cases, and many more, have been sent to the writer within a year past.

How apparent, too, the need of experiments, such as require the most thoughtful, pains-taking, and accurate attention.

We know that white hellebore will destroy the currant slug (*Nematus ventricosus*, *Klug*), but the equally destructive drop caterpillar (*Arbraxis ribearia*) which appeared in great numbers in South Haven the past summer, awaits a satisfactory remedy, and the same is true of that worst pest of the apple orchard, the codling moth. I might mention a score of cases where experiments were just as imperatively demanded. Does not the great saving to our peachmen, by the simple method of fighting the curculio, discovered by Mr. Ransom of St. Joseph, suggest that many of our preventives, which are considered satisfactory, are capable of very marked improvement?

A third need that economic entomology may work its most perfect work is, that by free use of the press, all our farmers may learn what is their true policy in warding off these terrible enemies. For it is imperative that this warfare find recruits on every farm, and in every orchard and garden. The most perfect preventives cannot work their best cure, without the most perfect concert of action. Do you ask how all this can be accomplished? You may demand and see to it, that a State Entomologist is appointed who shall give his entire attention to this matter, or you may give it solely into the charge of the Entomological department of the Agricultural College. Heretofore the Professor of this department of the College, has had to teach from three to five hours daily, which together with the entire charge of the Zoological and Geological museums, and the Apiary, has left little time or energy for any outside work. I am happy to state that he is to be considerably relieved from such a press of necessary duties for the coming year, and this will doubtless be more and more the case, as the College comes to possess more means; in which case such work and investigations as indicated above, may largely engage the attention of this department, thus greatly benefiting the farmers and fruit-growers of the State, as also exerting a valuable reflex influence upon the College itself. There is no question but that a limited amount of teaching would add to the influence and accomplishments of the investigator, and it is equally true that the work as indicated above, in its full scope, would also enable the teacher to be more efficient in imparting instruction.

Heretofore the College Entomologist has been so occupied that experiments must needs be very limited, while time for visits and examinations in various sections of the State, save in vacations, was entirely precluded. Already the College has scattered active observing entomologists on farms all about our State, already has arranged a fine cabinet for study and comparison, which is much consulted by others than those at the College, already made experiments which have worked out some valuable results, and with more opportunity, which even now is being offered, still greater benefits will be received by the College, and greater good will be extended to our most important industries throughout the State.

LAKE MICHIGAN: HOW IT AFFECTS FRUIT CULTURE.

READ BEFORE THE STATE POMOLOGICAL SOCIETY, BY HENRY S. CLUBB.

After describing the east shore of Lake Michigan at the Ionia meeting of the Michigan State Pomological Society, a question was raised by a gentleman present in relation to the influence of Lake Michigan on fruit culture. As no one took up this question, I have essayed to introduce the subject as a fitting sequence to my former paper. Not that I expect to exhaust it, but enough will be accomplished if I shall write that which shall eventually lead to an accredited theory when it shall have been thoroughly investigated.

THE SUBJECTS TO BE CONSIDERED.

The effect of the various seasons on the lake; the influences exerted when so affected; the varied temperatures of the atmosphere under certain circumstances, and the power and influence exerted by the lake on the adjacent country, are all subjects of deep interest to the lake shore horticulturist, and are worthy the most careful investigation.

THE LAKE IN THE SPRING.

The spring season finds Lake Michigan a mass of water nearly covered with floating ice. The storms of March and the rains of April having broken up the ice in the rivers, large quantities of ice find their way to the lake, where they are driven hither and thither at the mercy of the winds and the waves. Sometimes there are drifts and gorges of this ice on the west side, but more frequently it hugs the east shore, and is so extensive that the blue, open water beyond is scarcely distinguishable from a dark cloud on the horizon, as one stands on the east shore. None but the most daring navigators with the stoutest-built propellers will venture through this terribly seething, and sometimes terrific mass. Milwaukee and Grand Haven are, at present, the only harbors kept open throughout the ice season.

THE LAKE SHORE ICEBERGS.

The shore is usually protected by a pile of ice from twenty to fifty feet in height, which has been thrown up during the winter by the action of the waves.

EFFECT ON ADJACENT LANDS.

The effect of this floating ice, and this pile of ice and snow on the shore, is to retard the season. The prevailing winds being from the west, southwest and northwest, the east shore is kept backward by the cool breezes, which permeate the fruit trees and prevent that early expansion of the peach-buds so much deplored on the west side of the lake, and which renders the destruction of peach prospects so common every spring in the western and southern States. Not until summer weather is fairly established and danger of lake frosts over, does the water of Lake Michigan become warm so as to melt the ice and the sun dissolve the ice wall so as to allow the breeze which passes over the lake to permit the expansion of the fruit buds on the peach trees of the eastern shore.

GRADUAL ADVANCE OF SUMMER.

As the season advances the water of the lake, which has hitherto been so much cooler than the atmosphere received from south and west, gradually warms by the influence of the sun's rays and the land breezes. It is much less changeable in its temperature than the land breezes. It warms slowly, but when warmed it retains the heat proportionately with its depth and volume.

CONSERVATIVE TENDENCY.

The effect of this warm condition of the lake water is to prevent sudden changes on the lee shore. Regularly as the tides of the ocean the summer breezes traverse the land and water along the lake shore. In the forenoon the breeze is usually towards the lake, and in the afternoon a lake breeze comes over the land, modifying the temperature and making the hottest days of July and August pleasant and agreeable, healthful alike to animal and vegetable life. This is the true system of ventilation, of atmospheric drainage, and where the sloping hillsides are favorably formed, almost certain is the exemption from summer frosts.

ATMOSPHERIC MOISTURE.

As summer proceeds with its work of perfecting fruit, the lake has not only a protecting but a fertilizing influence. The intense heat of the sun is exerted on a large expanse of water, and the atmosphere is laden with the moisture drawn up during the day, and in the driest season dew comes to the aid of exhausted nature, and, wherever cultivation of the soil is properly attended to, the cooled earth condenses the moisture and absorbs it, producing the best possible condition for growth. In calm, summer weather, this condition is probably best secured along the lake shore, as during strong winds the moist air is apt to be carried further inland before the earth, cooled by cultivation, can condense and absorb the moisture, and immediate proximity to the lake in strong summer winds may be no great advantage, but as summer is the period of calm and the winds are seldom strong or violent, the moist lake air is an important element of fertilization. It is a fact, well-established in my observation of Ottawa county, that land within six to ten miles of the lake is less liable to suffer during a long period of dry weather than land further east.

SOIL RETAINING MOISTURE NEAR THE LAKE.

Plunge the hand into the loose sand of our lake shore during the most severe drouth of summer, and you find moisture within a few inches of the surface,

while digging twelve to eighteen inches deep in the ploughed field twenty miles from the lake will fail to develop any indications of moisture.

THE FALL SEASON.

After serving to enlarge and perfect the fruit by its moistening influence, the lake is still at work. It again assumes the office of protector, but in a different manner: in the spring it protected the fruit by holding it back, by retarding the swelling of the buds, by its cold atmosphere; but in the fall it performs its functions by retaining and exerting its acquired heat. The deep water of Lake Michigan is as slow to give up its summer heat as it was in the spring to yield its winter cold. It is to Michigan in the fall and early winter what the Gulf stream of the Atlantic is to Europe. It prolongs summer and fall weather along its eastern shore, along the western counties of the State, far beyond the period of killing frosts in the interior counties or on the western shore of the lake in Wisconsin and Illinois. It keeps off early fall frosts even more effectually than it avoided or warded off those of early summer. The fruit upon the latest varieties of the peach and several varieties of grapes have ample time to perfect to thorough ripeness before the frosts intercept their work, while the young fruit buds, for the succeeding season, develop, stop their growth, and the young wood ripens so as to withstand the rigors of succeeding winter storms and cold.

FALL SEASON PROLONGED IN THE NORTH.

It seems that the gradual flow of water from the southern extremity or head of Lake Michigan to its northern exit at the Straits of Mackinac, has the effect of reversing the usual experience in northern latitudes. Instead of cold and frost setting in earlier in northern than in southern Michigan, the very opposite is experienced, and several weeks after peach trees have been denuded of their foliage at St. Joseph and other regions south, they are in full leaf at Northport, in Leelanaw county, and other places around Grand Traverse Bay. The influence of the lake stream is here as marked as is that of the gulf stream in England and other portions of northern Europe where the temperate season is prolonged, along the sea-coast many weeks longer than in the same latitude on the western shore of the Atlantic, or even in the interior of Europe.

THE LAKE IN WINTER.

Long after the small lakes and principal rivers of Michigan have become frozen over, Lake Michigan maintains its high temperature and consequent freedom from ice. Its breezes constantly temper the wind to the necessities of the fruit grower along our western coast. It remains substantially open, in fact, during the whole winter, making a difference during every cold period of from ten to twenty degrees in favor of the peach belt.

FIRST EFFECT OF COLD ON THE BEACH.

The first effect of a sharp frost on the lake shore is a matter of peculiar interest. Before ice forms to any extent on the lake, the effect of a frost on the lake shore is to coat over with ice the beach and every article upon it near enough to be touched by the spray. Walking along on the beach of the lake when the temperature is down to 20° or 15°, everything is not only glazed over with ice, but is frozen fast to its place on the sand. You see a beautiful pebble glistening in the sunlight, you naturally stoop to pick it up to examine the dazzling object, but to your disappointment the stone is fast, and your effort is

in vain. The sun darting his full rays upon the scene and the whole shore is illuminated with dazzling brightness. Every stone, the sand, and even the usually dull and uninteresting drift-wood reflects with brilliancy the clear, bright rays. The cold continues; the waves dash with monotonous music on the shore, and the ice thickens on the beach. Drift-logs from being thinly coated with ice gradually assume new forms. Icicles form rapidly;

"The pendant icicle; the frost-work fair,
Where transient hues and fancied figures rise;"

every particle of drift-wood becomes an object of interest and of beauty; the ice combines, perhaps, with snow, and form objects of beauty in form, exceeding in grace and exquisite delicacy the finest creations of the sculptor's art. Forms arise as different from the original log or stone as can well be imagined, all dressed in the purest robes of white and crystal. No matter how common the shape or how worthless and unsightly the drift, it is now reformed and renewed into an object of surpassing and astonishing interest. The forms are so varied that every step is accompanied by a new surprise. The scene becomes bewildering, and the idea becomes irresistible that the simplest operations of nature can suddenly transform the most commonplace objects into subjects for wonder, admiration and enchantment.

A NATURAL BREAKWATER.

All these works of sculpture are produced when the lake is in its ordinary mood without extra commotion. As winter advances the ice thickens, and snow perhaps mingles with the spray still more abundantly; every day a new aspect is presented by this new-formed shore. Beginning with these simple and afterwards wonderful formations, if the cold continue, the bulk of ice and snow increases in thickness until it assumes the form of an immense but somewhat irregular wall, skirting the lake at the point where the force of the waves is usually expended. This wall forms a natural breakwater, against which the waves dash with a violence increased by the stubbornness of the resistance it presents to the course of the waves up the beach. The greater the resistance, the more abundant the spray, and, with the temperature of the air perhaps near to zero, every assault made by the waves increases the height and thickness of the barrier. So far from breaking down the wall, their action adds to its strength, until it becomes an imposing barrier.

WINTER STORMS.

But all this comparatively quiet work is only preparatory to the coming conflict. The lake, as the cold continues or increases, becomes partially covered with ice, which is broken up into pieces by every windstorm. This broken ice is dashed up with great violence against the ice-formed barrier on the beach, and in violent storms thrown completely over the ice wall, is piled up upon it and greatly augments its breadth and height. Storm after storm succeeds, until what was once simply beautiful in its form and sunlit glittering, becomes now grand and majestic. Ice is piled on ice, and the whole dashed with water and frozen until a solid mass is formed firm as a rock, rivalling the lake-bluffs and hills in their height and dimensions, and far exceeding them in brilliancy whenever favored with a brief interval of sunshine.

EFFECT OF THE WINTER'S WORK.

But what has all this commotion and this gigantic wall-building to do with the effect of Lake Michigan on the fruit-growing of its eastern shore? I reply, it is the method this lake has, not only of protecting the ordinary banks of the lake from incursions during the winter storms, so that the farmer on the shore may not lose his acres, but this mass of ice forms one of the principal agencies of the lake in retarding the expansion of the peach-buds during the spring. It is the great refrigerator or reservoir of cold that holds back the peach-buds until the danger of a late frost has passed. It is the fruit-grower's ice store, piled up without any of his labor and placed just where it is needed for protection from that sudden transition from winter to summer so remarkable in this latitude. Under its cooling influence the peach buds "bide their time" and do not burst into blossom until danger of blighting frost is over. This accumulation of cold, so to speak, is just as important in the spring as was the store of warmth in the fall. The whole effect is to prevent sudden transition from heat to cold and from cold to heat. The lake is the great evenor of the temperature at all seasons, counteracting all extremes of temperature and modifying the effect of all sudden changes.

THE SNOW DRIFT.

Nor is this great ice wall and its accompanying floe of broken ice in the lake, important as they are, the only provision made by the lake to protect the fruit husbandry of the adjacent country. The operations of the lake breezes on land during the terrific snow storms of winter are of similar importance. The snow that would, were it not for the wind, fall on the lake, is taken over the coast, on and on, from one to six and frequently ten miles, where it is drifted to great depth. Were it not for the wind this snow would cover the ground twelve to twenty inches evenly, and the first few days of warm weather would dissolve it; but piled in immense drifts it continues for weeks giving forth its cooling influences gradually; retarding vegetation in locations that would otherwise be but little benefited by the lake, and thereby carrying lake benefits further inland than could be secured without. So important is this snow drift regarded by some fruit men that I have heard it claimed as marking the true peach belt. But I am inclined to regard it as a wise provision for widening and increasing the security of that belt.

WHERE THE DRIFT FORMS.

This drift does not form in gulleys or on low spots alone. It is just as likely to form on high as on low land, wherever some obstruction to the course of the wind renders the location favorable for a drift. A peach orchard that is so located as to attract the drift, as is often the case within the limit named, secures almost certain protection from winter and spring frosts. In such localities figs could be grown with almost the same certainty as peaches, the snow being a most perfect protection for these exotics.

THE ROUTINE.

I have now passed in review the operations of Lake Michigan during the four seasons of a year. These operations are varied at different seasons, but all produce the ultimate effect desired on the adjacent country. Different years also

modify these operations, according to their severity of heat in summer and cold in winter, but the general routine is as I have related.

THE RESULT ON THE EAST SHORE.

These varied functions performed by an insensible body of water, producing results worthy the highest intelligence and wisdom, are among the mysterious phenomena which fruit-growers are learning to appreciate in studying their favorite pursuit. Poets and theologians each clothe this subject with their peculiar graces of language. Thompson, speaking of the seasons, says :

“ These as they change, Almighty Father, these
Are but the varied God.”

It remains, however, for the pomologist to gratefully accept these wonderful provisions for his special advantage, and co-operate with them in making the eastern shore of Lake Michigan that perfect garden of luscious fruits which is evidently its glorious destiny.

SAUGATUCK AND GANGES:

THE FRUIT REGION OF THE KALAMAZOO.

A REPORT TO THE STATE POMOLOGICAL SOCIETY FOR 1874, BY HENRY
S. CLUBB.

The development of those localities in Michigan adapted to the cultivation of the choice fruits of the temperate zone is of such vast importance to the interests of our State that I deem no apology necessary for presenting a description of the fruit region near the mouth of the Kalamazoo river as one of great promise.

UNBIASED DESCRIPTION.

Not being either a resident or owner of land in this region, and having interests in a fruit region thirty miles north of the Kalamazoo, I trust I shall be enabled to give a disinterested description,—one which shall not subject me to the charge of partiality on account of those interests. I would that fruit men generally should take an honest pride in localities possessing merits regardless of their own pecuniary or property interests. Every locality should be viewed on its own merits, without regard to other locations.

EACH REGION WORTHY OF SEPARATE STUDY.

In a somewhat extensive examination and careful inspection of the localities along the east shore of Lake Michigan, I have arrived at the conclusion that each location is entitled to credit for advantages peculiar to itself, and any account of the fruit regions of Michigan which should characterize all from an inspection of one or two, would fall far short of doing justice to the subject or to the regions indicated. While there are undoubtedly advantages common to all the lake shore harbors and their surroundings, there yet are peculiar features connected with each which no general description can reach. Every locality is a study by itself, and should be separately considered.

A GOOD HARBOR ESSENTIAL.

With all the separate regions of the lake shore, a harbor connecting the locality with Lake Michigan is the central point of attraction. Proximity to a good harbor has more to do in determining the value of a location for a fruit farm than any other one consideration. As the practice of drying fruit for market on an extensive scale shall become general, this feature may lose some of its importance, although drying factories are now, for the most part, located well

for shipping facilities. The time will come when good drying or canning facilities will be established in close proximity to orchards, with less regard to shipping the dried fruit than the transportation of fruit from orchard to factory.

THE KALAMAZOO HARBOR.

The harbor formed by the Kalamazoo river, forming the shipping-point of this region, is a good one,—about equal, perhaps, to that at Manistee, one of the best on the shore. It has been improved by the construction of piers, and now has an average depth of twelve feet on the bar at the mouth. The policy of completing all the harbors in the order of their importance has been adopted by the United States government, and if political changes do not affect this policy, the harbor at the mouth of the Kalamazoo will, in a few years, be made accessible to the largest steamers. Advancing up the stream around a beautiful bend in the river,

KALAMAZOO LAKE,

an enlargement of the river, forms a spacious harbor for the villages of Saugatuck and Douglas. It is nearly a mile wide, and about a mile and a half in length. It is well protected from lake storms by a range of hills between it and the lake.

THE SURROUNDING COUNTRY.

The country tributary to this harbor consists of the two fractional townships of Saugatuck and Ganges, in Allegan county. Saugatuck in 1874 had a population of 2,205, Ganges 1,120; total, 3,325. Taxable land in Saugatuck, 15,299 acres; in Ganges, 18,420 acres; total, 33,719, of which 8,829 acres are under cultivation and 1,186½ acres planted to fruit trees, 21 acres in grape vines and about 10 acres in small fruits. About three-fourths of the orchard land is planted with peach trees, and the other fourth with apple trees.

ELEVATION, SOIL, ETC.

The land in these townships varies in elevation from 25 to 150 feet above the lake level. The lake front of twelve miles is mostly open to the lake, except about three miles at the north, where it is divided from the farming land by a ridge of sand hills mostly covered with a thick growth of timber. The general character of the land is rolling, the hills being chiefly sandy and gravelly loam, although some are of clay, and the depressions are mostly a rich, black vegetable mould well adapted to market gardening, small fruits, etc. It is very productive, yielding, with proper culture, immense crops of corn. Onions yield 350 to 400 bushels to the acre on this black soil. The high land is well adapted to orchards: the clay for apples, pears and quinces, the sandy and gravelly soils just suitable for peaches and grapes, which grow with great vigor. Most of the peach orchards are young and thrifty, while those that are ten to fifteen years old show excellent preservation, and are just coming into good bearing condition.

POINT OF VIEW.

The best point of view of this interesting country is the top of a hill known as "Baldhead." It is a sand hill between Lake Kalamazoo and Lake Michigan. It has an elevation of about 200 feet. It is covered with forest except on the western slope and on the top, which is white and bare: hence its name.

GENERAL VIEW.

Standing on this elevation the two villages of Saugatuck and Douglas, with Lake Michigan between, are seen to great advantage. Between the hill and Douglas is the magnificent peach orchard of B. S. Williams & Son, known as the premium orchard since the State Pomological Society awarded it that honor.

THE VIEW SOUTH.

To the south the range of hills, of which Baldhead is the most prominent, extends about a mile along the shore, gradually diminishing in altitude until reaching the level banks where the lake shore road continues for some distance within a few feet of the clay bank, and where, in fact, that bank has been at places washed away by the action of the waves forty or fifty feet below so as to encroach on the road, making dangerous places for night travel.

FARM HOUSES ON THE SHORE.

Along this road are several good fruit farms, the houses of which are in some instances wholly exposed to the lake. Others have partial wind-breaks of forest trees. It is found where the lake shore is abrupt, as it usually is on clay banks, houses about fifteen or twenty rods from the brink are in a great measure protected from the force of the storm by the bank, even if level on top and entirely denuded of forest growth. The storm, however, regathers strength farther from the lake, and rising ground beyond will receive its full force.

VIEW NORTH.

The sand hills on the north side of the Kalamazoo extend along the shore, under the shelter of which are numerous small farms and orchards. The soil, however, is not generally as strong as farther from the lake and on the south side close up to the shore.

THE DISTANT VIEW—EAST.

In all the region taken into view from the hills, the greatest diversity of soil and surface is visible. Taking the field glass the dim distance in the east brightens up as the sun gleams forth on distant hills, forest, clearings, orchards, little lakes, and the winding river. Not only the township of Saugatuck, but Manlius and Heath become visible, where the farming lands attain an elevation equal to that of the lakeside hills.

THE VIEW WEST—THE BAY.

On the west of the sand hills the lake shore describes a graceful curve, forming a bay about five miles wide and of great natural beauty. At the center of this bay is the mouth of the Kalamazoo, the lighthouse and the piers. The bay has a beach of sand north of the harbor, and of stones on the south, the whole being plentifully spread over with drift-wood.

THE BAY SHORE.

Along the shore of this bay is a most romantic region of hill and dale, with forest trees of several prominent varieties, interspersed by the meanderings of the river, forming landscape and water views of great beauty. It is a natural park for the inhabitants of the neighboring villages, and is used in the summer season for picnics and encampments. It is interspersed by pleasant walks and drives, mostly originated by Indian trails, but kept open by pleasure-

seekers who delight in climbing the hills, descending into the valleys, passing along the natural avenues, tarrying in the charming nooks and pleasant dells, and listening to the music of the waves and the birds.

WATER PRIVILEGES.

The water privileges of this region are numerous. Silver Lake is a long arm of Kalamazoo Lake, as long, but not so wide as the lake itself; the Kalamazoo River has some sixteen miles of navigable frontage. Goshorn Lake, on north line of Saugatuck township, supplies both mill and tannery; Lake Hutchinson, in Ganges, is the head-water of Black River, which waters six sections of land in that township. It is a beautiful lake, surrounded by well cultivated farms. Numerous springs and streams are found in every direction, scarcely a quarter section of land being without its living water-course. These streams and lakes often modify the effect of the eastern winds, over which the great lake can have only a secondary effect. They can, in some cases, be made available for irrigation, and will probably make cranberry culture a profitable pursuit in this region.

THE FARMS AND ORCHARDS.

By invitation of the Lake Shore Agricultural and Pomological Society, which has its headquarters at Douglas, and which meets alternately at Douglas and near Pier Cove, I recently visited this region and prepared for publication a pamphlet, giving some account of this interesting fruit region. In that report I have made note of about 163 farms and gardens, showing what has already been accomplished. From that report I make the following extracts:

THE PREMIUM ORCHARD.

Messrs. B. S. Williams & Son have the honor of owning the forty acres on the southwest side of Kalamazoo Lake. Two and one-half acres in grapes, planted eight feet apart, in 1869; the first crop, in 1872, consisted of a ton of Concords; in 1873 all varieties bore, aggregating ten tons. Less than an acre of Concords bore more than five tons. The other varieties are Dianas, Ionas, Hartford Prolifics, Ives' Seedlings, and some Rebeccas and Salems. The Concords are the heaviest and surest bearers. Ionas and Dianas do not ripen so early here as further from Lake Michigan. The orchard being close to the lake shore, and partially sheltered by hills, the air is cooler in summer than further inland. The falling off of the Hartford grapes, Mr. Williams thinks, can be in a measure obviated by pinching back and thinning out the bunches. The Hartfords sell readily for Concords in the market, and fetch a better price, as they market before Concords can be marketed. The Delawares, for the past three years, were badly injured by the cut-worm, but after that they made good growth, and came into good bearing. Planted 600 peach trees in 1867, 850 in 1869, and 2,000 since, filling up vacancies; making the present an orchard of about 3,000 peach trees. Those planted in 1867 and 1869 produced 5,500 baskets in 1874, notwithstanding many of them had died from various causes. The peaches consist of Early and Late Crawford, Jacques' Rareripe, Early Barnard, Old Mixon, Hill's Chili. Old Mixon and Jacques' Rareripe proved the most profitable peaches. Jacques' Rareripe was most profitable while young, but Old Mixon became more profitable as it gained in age. The Early Barnard coming in with the Early Crawford, is less profitable than it would be without that formidable rival. Seventy-five Hale's Early did

not prove so profitable, because people were afraid to purchase them on account of a supposed tendency to rot. They, however, bore well, and some years they show no symptoms of rotting. One hundred and twenty-five standard pear trees, planted in 1870 and 1871, not yet in bearing. Fifty sweet cherries, planted in 1869 and 1870, are making excellent growth. Six hundred apple trees, planted at various times, are making good growth. One-quarter acre of raspberries and blackberries. Strawberries raised between the rows of peach trees. Rows three and one-half feet apart. Cultivated two or three years, and then plowed in. Produce about 130 bushels of strawberries to the acre. The Wilson's Albany is the variety used. This fruit farm is one of the best in the State. It is located so as to receive the full benefit of the lake breezes, the west, southwest, and northwest, while Lake Kalamazoo tempers the northeast wind fall and spring. The residence is well located on an eminence, commanding a good view of the lake, and of the villages on each side, and itself forming a prominent feature of the landscape.

THE LARGEST ORCHARD.

Messrs. Williams & Wiley own the largest peach orchard in the region. The farm consists of 110 acres, in Douglas. Forty acres peach trees. Commenced planting in 1867. Shipped in 1874 15,200 baskets of peaches. Two acres of grapes, consisting of Concords, Delawares, Ives, Hartfords, Dianas and Ionas, all of which ripen well. The Diana grape was in excellent condition December 13th, and the Iona only slightly shrivelled. Mr. Wiley thinks the Diana a profitable grape on account of the keeping quality. Its flavor improves by keeping, as the muskiness is diminished, and almost entirely lost by keeping a few weeks. This firm is preparing to plant another forty acres to peaches in 1875; theirs will then be one of the largest orchards on the lake shore. It is located about a mile east of Lake Michigan, on a fair elevation and slightly rolling land. The soil of the farm is diversified both in quality and altitude, the highest and most sandy land being selected for peaches. Mr. Wiley has a simple contrivance for drying fruit, and dries a large quantity of peaches without peeling.

UTILIZING SWAMP LAND.

Mr. Van Renselien Wadsworth has demonstrated the value of swamp land on his farm. He has 80 acres on Town line road: 900 apple trees. Also 80 acres on the Hooter road, two miles south of Douglas. This last named farm was principally black ash swamp, the soil being an average of five feet in depth, of black muck. It was chopped over about twelve years ago. Mr. Wadsworth first completed a drain, which had been commenced by commissioners, and having succeeded in carrying off the water, he cleared up and burnt over his land, and from one acre he raised 400 bushels of onions in 1874. He is so well pleased with this success that he has prepared ten acres for onions in 1875. He raises the Early Danvers variety. He uses Comstock's onion weeder, cultivator and drill, which facilitates the labor, and makes onion raising on a large scale practicable and profitable.

GOOSEBERRY AND CURRANT CULTURE.

Mr. Joseph Hattersley, an intelligent English gardener, has eight acres at Pier Cove. About 500 peach trees; 2,000 grape vines; numerous currant and gooseberry bushes; grows red, white and black currants for market quite successfully. Two dollars and a half a crate, or \$5.50 a bushel, is the price real-

ized for currants. Mr. Hattersley's method of trimming currants is to preserve the tree form, trimming off all suckers. He keeps the ground well cultivated and clean. He says that a barrel of currants grown on this plan will produce a barrel of wine, whereas it will take several barrels of currants grown on suckers to make one barrel of wine. Mr. Hattersley claims to have budded the first tree and planted the first grapes and pears in this vicinity.

BOYS WHO STAY ON THE FARM.

Mr. S. I. B. Hutchinson, near Pier Cove, with his two sons, cultivate forty acres. Eight hundred peach trees planted in 1863-4-5. In 1869 gathered about 1,850 baskets; good crops since. In 1874, 3,000 baskets were produced. The peaches were held in high esteem in Chicago. Will plant 1,000 peach and 150 apple trees in 1875. Nine hundred apple trees, 600 of which are commencing to bear, producing 200 bushels in 1874. Six hundred and fifty grape vines,—Concords, Delawares and Dianas. Shipped in 1874, 362 ten-pound baskets of grapes.

Is it likely Mr. Hutchinson's sons would do any better by crowding the professions in a city? Their prospects are improving every year.

TO BE A MODEL FARM.

Mr. Augustus Perrotet, with the intention of making a model farm, has commenced on eighty acres on the lake shore in Ganges, 1,000 peach and 120 apple trees; 1,200 grape vines. This orchard has a wind break of forest, forming a very romantic grove along the lake shore. The land rises gradually from the lake shore to an elevation of about 100 feet. The dwelling is about forty rods from the road, and in front of it is a heavy soil on which grass grows luxuriantly, forming a good lawn. The fruit trees are planted on the highest land, and the whole farm is being planned for a model farm, Mr. Perrotet having all the taste of an artist combined with the skill of a practical horticulturist. Every variety of soil, elevation, and aspect is found in various portions of this farm, and its close proximity to Lake Michigan renders its climate all that can be desired for a model fruit farm.

CORNER'S SEEDLING PEACH.

Mr. William Corner has 100 acres on the Town Line road; 400 apple and 1,200 peach trees; 1 acre grapes; 1,600 baskets of peaches in 1873 and 1,775 in 1874. Only three and one-half acres of the peaches are yet in bearing. One hundred and fifty rods of ground planted with trees grafted with a seedling raised by Mr. Corner, produced in 1874 1,500 baskets of peaches. This seedling resembles the Early Barnard, but is more thrifty and larger. Mr. Corner first raised this seedling, and, finding it a desirable peach, top-budded from it with the above result. Some roots budded in 1873 were attacked by a small beetle that was destroying the buds. Mr. Corner, on making the discovery, plowed to the rows and carefully covered the buds, using the hoe to be sure of covering all. When the bugs disappeared in three or four days, the buds were uncovered and the crop of trees saved. Others whose buds were attacked in the neighborhood by the same insect lost the entire crop. Mr. Corner has also 1,400 black, red, and white currant bushes trimmed on Mr. Hattersley's plan.

MANURING PEACH TREES.—ONION CULTURE.

Forty acres at Plummerville: 2,500 peach trees, half of which were planted in 1866 and the balance in 1874; 120 apple trees planted in 1859, and one acre

of strawberries. The old trees produced 1,600 baskets of peaches in 1874. Eight hundred grape vines. Only lost five or six trees during the severe winter of 1872. Stops cultivating peach trees in the middle of July. This orchard has been manured with tannery waste, and is in a very thrifty and healthy condition, with promise of an abundant crop in 1875. The peaches on this enriched orchard are very large, but not so numerous as they would have been on poorer soil. Between the elevations is black soil, which on being drained has been proved to be splendidly adapted to onions, 750 bushels of which were produced in 1874 from two acres. Mr. Hawley is making a specialty of the Yellow Danvers onion, and is producing not only large crops for market, but raises fine seed of this variety, grown from selected onions. For this he has a great demand, and intends to plant 200 bushels of onions in 1875, from which he expects to supply the increasing demand for seed. Many farmers, seeing Mr. Hawley's success, are preparing to sow onions in 1875, and they all prefer seed known to be raised from solid, globular onions, and Mr. Hawley plants none other. Mr. Hawley has adopted the plan of sowing oats with strawberries, so as to mulch them with straw that will not blow away.

WINE MAKING IN SAUGATUCK.

Mr. Richard B. Newnham has a two-acre lot in Saugatuck: forty pear, 100 peach, and thirty-five apple trees; three-fourths acre of grapes. This interesting garden was commenced seven years ago as a clearing. Peach trees planted four years ago and now in good bearing. From fifteen trees of Hale's Early, Mr. Newnham gathered in 1874 sixty baskets of peaches. One Early York produced twelve baskets. Crawford's did not bear as well. Twelve trees of Stump the World, planted four years ago, yielded over twenty baskets. Very fine quality. All these trees were thinned carefully, but the Early York, with its twelve basketfuls, split badly with its weight of fruit. Pear trees bear so well as to require thinning. They have suffered from sun-scald on the south side of the standard trees, the bark turning black where unprotected from the summer sun. Where protected from the sun's rays they remain sound and without blight. Where injured in this way, the trees have been restored by a plaster of cow dung. Duchesse D'Angouleme, White Doyenne, and Bartlett are especially liable to overbear. Of grapes, the Creveling, Iona, and Clinton are remarkably successful. Gathered in 1874 three bushels from one Clinton vine six years old. Made 100 gallons of excellent wine, besides otherwise using a large amount of grapes. The Iona wine was particularly rich with aroma and bouquet. Mr. Newnham mashes the grapes, and as the mash runs from the press sugar is added. It is then allowed to ferment in a cask, and when fermentation stops, the cask is bunged close, allowed to stand several weeks till clear, and then racked off into another cask. His wine sells readily by sample.

HIGH CULTURE FOR GRAPES.—EXHIBITING VINES IN BEARING.

Mr. Theodore F. Kleeman: Ten acres south of Lake Kalamazoo. Four acres grapes, 300 peach, 20 pear and 20 apple trees. Grapes consist of Ionas, Delawares, Clintons, Burgundies, Muscatells, Catawbas, and Dianas. The Muscatells are much larger than Concords. Also several grapes imported direct from Germany, consisting of Silfani, a small green grape about the size of the Delaware; the Golden Red, about the size of the Iona, but more red than the Delaware; and the Goodeder, a large white, round grape. These new grapes were planted last spring, and have made excellent growth. Another vineyard

on the north side of Lake Kalamazoo, of Isabella and Clinton grapes, bearing at the rate of five tons to the acre. Mr. Kleeman made fourteen barrels of wine in 1873, and fifteen barrels in 1874. He retails the wine at his billiard saloon in Saugatuck. His mode of planting vines is to dig holes seven feet deep and fill in with rotten wood, scraps of leather, hair and lime from tannery, and other rubbish. Vines planted in this made soil produce canes twenty to forty feet long, and one inch in diameter, in a season. Mr. K. has layered vines in pails of earth sunk in the ground, and when bearing he removes them for exhibition at Chicago, Grand Rapids and other fairs, where they make an excellent show and readily sell for five dollars each. Mr. Kleeman has an acre block in the village of Saugatuck with 400 vines planted on terraces around the south and east sides of the hill. These vines, he estimates, produced six tons of grapes in 1874. He has 40 peach, 40 apple, 24 pear and 12 plum trees; also currants and gooseberries.

PRODUCTIVE THREE-ACRE GARDEN.

Rev. J. F. Taylor, a careful horticulturist, has a three-acre block in Saugatuck village; 25 peach, 12 plum, 12 cherry, 24 pear and 12 apple trees, all in bearing except the last. Peach trees planted in 1869 bearing full. In addition to a good supply of fruit, this garden produced in 1874 400 bushels of onions on less than an acre, 100 bushels of beets and turnips, 24 bushels of early potatoes. Mr. Taylor also has 65 acres on the lake shore, three miles south of Douglas, on which are 300 peach trees planted in 1864, and 200 planted in 1874. Those first planted bore well after the severe winter of 1872, and since yielded 300 baskets in 1874. Two hundred apple trees planted in 1866 and 100 in 1874. Although this farm is on the lake shore, a portion of it is rich black loam, and being prepared for market gardening. It produced in 1874, 80 bushels turnips, 80 bushels beets, and 75 of potatoes.

SUMMARY OF PRINCIPAL ADVANTAGES.

The advantages for fruit growing most prominent in the Saugatuck and Ganges Fruit Region, and which render it desirable for residence, are:

I.—Its location on the east shore of Lake Michigan, at the widest part of the lake, affording greatest protection of the prevailing winds, which are west, southwest and northwest.

II.—Its exposure to the unobstructed lake breeze, the whole of Ganges and the greater part of Saugatuck townships being open to the lake shore, without the intervention of sand hills or unproductive sand dunes, securing great mildness of temperature.

III.—Rolling and diversified topography, with a large proportion of high land.

IV.—Unusual diversity of soil, even close to the lake shore, there being few farms or quarter sections of land that do not afford opportunity for all descriptions of farming, including dairy, grain and fruit.

V.—Those sites more especially adapted to fruit are usually adapted to all the varieties of fruit, from the early strawberry to the latest peach, and winter apple.

VI.—Specially adapted to fruit growers with small capital, because good paying crops of small fruits can be raised while trees are growing, and even the first year after clearing the land.

VII.—Land is cheap and abundant, and being owned by persons and companies who desire to sell and are able to wait, can be had on reasonable terms.

VIII.—Proximity to good markets by water and railroad communication to Chicago, Milwaukee, and the illimitable west and northwest, where fruit has a constantly increasing demand.

IX.—The Chicago and Michigan Lake Shore railroad runs along the eastern boundary of this region, and a fruit train with ventilating spring cars, especially constructed for fruit, is run every night during shipping season.

X.—The Lake Shore Agricultural and Pomological Society has appointed a committee consisting of Messrs. Perrotet, Wiley and Loomis, to arrange for the cheap transportation of fruit either by special charter or contract.

XI.—Fruit baskets and crates are manufactured at Saugatuck.

XII.—Several fruit-drying establishments will commence operation on the grist plan at convenient points in time for the next fruit harvest.

XIII.—An active and vigilant Horticultural Society, thoroughly devoted to fruit interests, and ready to aid settlers in making the business profitable.

XIV.—Good sectional and lake shore roads.

XV.—Very moderate taxes, and they chiefly for school purposes.

XVI.—Ample school and church accommodations.

XVII.—Grist mills at convenient distances.

XVIII.—Good mercantile establishments and moderate prices.

XIX.—Several efficient Granger organizations.

XX.—Masonic and Odd Fellows' Lodges in the several villages.

XXI.—Good American society and hospitality.

XXII.—Proximity to good reliable nurseries for trees.

XXIII.—Abundance of lakes, springs, and everflowing streams of pure water.

XXIV.—Telegraphic communications from Saugatuck and at the railroad stations with all fruit markets.

XXV.—Varied scenery, both of water views and landscape, affording good scope for artistic gardening and the construction of beautiful homes.

SPECIALTIES.

An inspection of this fruit region develops the fact that it is especially adapted to—

I.—The growth of peaches and grapes, with as much certainty as any farm crop, especially on the high lands that are light or gravelly.

II.—The growth of apples, pears and quinces on the clay lands.

III.—The growth of strawberries, raspberries and currants on the black soil, usually found between the hills.

IV.—The growth of onions on the black muck of the black ash and tamarack swamp land, which is abundant in patches interspersed throughout the region, and more especially along the north arm of the Black River, where O. R. Johnson & Co. have lands for sale.

These specialties are all crops commanding high prices. Onions, for instance, grown in this region have been known to fetch \$18 a barrel in the New Orleans market, while \$5 to \$7 a barrel are realized at the markets nearer home. At \$3 a barrel, an acre would produce \$400 worth.

HOW THIS REGION STOOD THE SEVEREST WINTER.

The year 1873 commenced in the midst of an unusually severe winter, and the State census taken in 1874 showed that in the produce of fruit, Ganges stood second and Saugatuck third in the amount of fruit produced in 1873, of

townships in the State; and considering that there are many townships south and north of here that have older and more numerous orchards, this shows that they are more favorably located for protection from the severest winter. The difference in temperature during the coldest weather is usually ten degrees in favor of this portion of the lake shore. This difference was shown also on the 9th of January, 1875, when it was 20° below zero at Chicago, 27° at Milwaukee, and 20° at Lansing, it was only 10° at Saugatuck.

FRUIT PRODUCE IN 1874.

Judging from the crop of 1874 it is safe to estimate the production of fruit in Saugatuck and Ganges 50,000 bushels or 200,000 baskets.

EXTENDING THE AREA OF PEACH GROWING.

It was estimated that at least 30,000 peach trees would be planted in the spring of 1875. In fact, one nursery agent that had only visited Saugatuck township informed me that he had orders for 15,000 peach trees, to be delivered for spring planting in that township alone, so that I think this estimate below the actual number to be planted. The peach growers are greatly encouraged by their success, and those who have planted most are the most enterprising in planting more.

POPULAR VARIETIES OF GARDEN VEGETABLES.

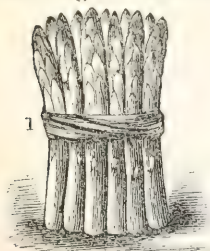
WRITTEN AND ILLUSTRATED EXPRESSLY FOR THE MICHIGAN STATE
POMOLOGICAL SOCIETY, BY JAMES VICK OF ROCHESTER, N. Y.

GENTLEMEN:—Your Pomological Society includes and has a horticultural department, I understand; that is to say, the lesser has swallowed the greater. But words, like vegetables, grow, and some words mean more than they did a few years ago. The word *grange* once signified a French hamlet or farm, but I am told that it means a great deal more than that now. So your word *pomology* has come to include, by common consent, garden culture and flower culture, and it is for this reason, I suppose, that I am invited to contribute something about vegetables.

The vegetable department at the state fair, is to many exceedingly interesting, and should be to all; for while we have no sympathy with those who say they “see more beauty in a cabbage or hill of potatoes than in the finest flower that ever grew,” we do most heartily agree with those who take pride and pleasure in the culture of choice vegetables, and their improvement, and who are ready to say with Diocletian, “Were you to come into my garden and see the vegetables I raise with my own hands, you would no longer talk to me of empire.” As much skill is required to produce an improved vegetable as a new and valuable flower, and perhaps as much as is needed to govern a nation; and the pleasure of success, we doubt not, is quite as great. The improvement in our vegetables for the past score of years has been great; indeed, we notice desirable progress almost every season, and more particularly in the purity of the seeds. The examinations of our trial grounds this year have been unusually satisfactory. To keep varieties pure and true to name, requires a constant struggle, about which the nurseryman and florists who propagate by budding and grafting, and by cuttings and divisions of roots, know nothing, and of which gardeners usually have but little appreciation.

ASPARAGUS.

This now popular vegetable is so well known that most persons who have had experience in vegetable gardening are pretty well acquainted with its habits. The Asparagus is a salt-water plant, indigenous to various parts of the coast of Europe and Asia, growing in salt-water marshes. It has escaped from our gardens, and is now found in some places on the American coast, and is sometimes observed in meadows. The plant is perennial, and grows



some five feet in height, with a branching stem, fine cylindrical leaves, small greenish flowers, and red berries containing black seed. The seed may be sown either in the spring or autumn, in drills about one inch deep, and the rows wide enough apart to admit of hoeing,—about a foot. An ounce of seed is sufficient for a drill thirty feet in length. Keep the soil mellow and free from weeds during the summer, and in the fall or succeeding spring the plants may be set out in beds, about a foot apart each way. The beds should be narrow so as to permit of cutting to the center without stepping upon them. The



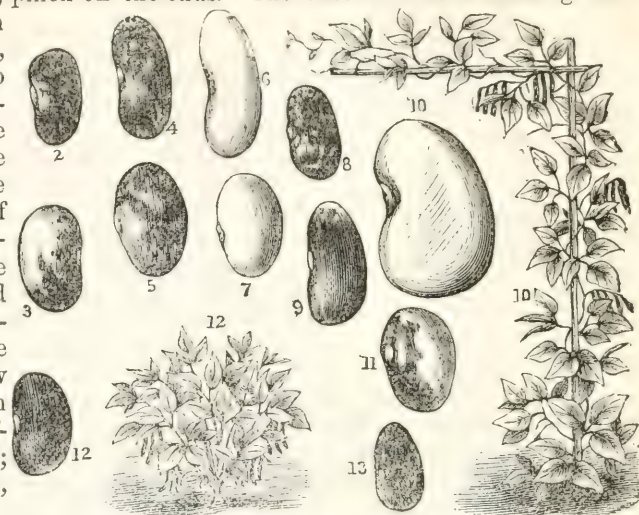
plants may remain in the seed-bed until two years old if desired. Before winter, cover the transplanted beds with about four inches of manure. A good many varieties are advertised, with but little difference. As Asparagus plants are all grown from seed, it will be seen that there is great opportunity for variation. Salt is an excellent manure for Asparagus, and an efficient assistant to the cultivator, keeping down the weeds with very little labor. When

grown in large quantities for market, Asparagus is often planted a foot apart in the rows, and the rows three feet apart, and sometimes three feet apart each way. Cut for use the third year after planting, and if the shoots appear pretty strong, a little may be cut the second year. The part used is the young shoots when about five or six inches in height, and when the bud is close and firm, and these should be cut a little below the surface, with a sloping cut. It is not best to continue the cutting late in the season, unless the shoots are very robust. Always give the bed a good dressing of manure in the fall, first removing the dead brush of the past season. An Asparagus bed will last longer than the maker, so it should be well made, and there should be no haste in cutting. Those who do not wish the trouble and delay of growing Asparagus from seed, can obtain plants, either one or two years old, at a very moderate price. Secure a good, rich, deep, mellow soil, and set the plants with the roots spread out naturally, just as a good gardener would arrange the roots of any tree or plant, and so deep that the crown will be two or three inches below the surface. In removing weeds be careful not to injure the crowns. In the spring remove them by hand. The engravings show a bunch of Asparagus as usually exposed for sale, and a branch of the plant at seeding time.

BEANS.

Beans are usually divided into two general classes, dwarf and pole beans. The dwarfs are earlier and more hardy, as a general rule, than the running sorts. The dwarfs are generally used for string-beans, when the pods are tender, and the climbers only for shelling. We have endeavored in the engraving to show the habit of both. Beans like a dry and rather light soil, although they will do well in any garden soil if not set out too early in the spring. Nothing is gained by planting until the ground is tolerably dry and warm. The Dwarf varieties grow from twelve to eighteen inches in height, need no support, and are planted either in drills or hills. The drills should be not less than a foot apart, two inches deep, and the seed set in the drills from two to three inches apart. The usual method in hills is to allow about four plants to a hill, and the hills two by three feet apart. Rows are best for the garden. A quart of ordinary sized beans is about fifteen hundred, and will sow two hundred and fifty feet of rows, or one hundred and fifty hills. Hoe well, but only when dry. Running beans should not be planted quite as early as the Dwarfs. The usual way of planting is in hills, about three feet apart, with a pole in the center of

the hill. A very good way is to grow the running varieties in drills, using the tallest pea brush that can be secured conveniently. When the plants reach the top of the brush, pinch off the ends. The effect will be to cause greater fruitfulness below. In a stiff soil, especially, the Lima comes up better if planted carefully with the eye down, the hill a little elevated. There are endless varieties of Dwarf beans; as nothing of the vegetable family is more inclined to sport. We have endeavored to show the appearance of a few of the best sorts, when ripe. Figure 2 is Refugee; 3, Early China; 4, Early Mohawk; 6, White Kidney; 7, White Marrowfat; 8, Early Valentine; 9, Early Rachel; 13, Wax, or Butter,—all Dwarfs. Figure 5, London Horticultural; 10, Large Lima; 11, Concord; 12, Giant Wax,—all Runners. The Scarlet Runner is the popular Snap Bean of England, and the Dwarfs are only used early in the season, before the Runners can be obtained.



BORECOLE, OR KALE.

The Borecoles, or as they are usually called, Kales, are not much grown in America, though quite popular in many parts of Europe. They do not form heads like the cabbage, but furnish abundance of curly leaves, those of some varieties being quite ornamental, their general character being shown in the engraving. The Kales are more hardy than the cabbage, and will endure considerable frost without injury, so they are often allowed to remain in the ground until spring, except in very severe climates, and are thus in use during the winter. When cut frozen, they are immediately placed in cold water. In northern countries, they are taken up and stored in a cold pit or cellar, and those not needed for winter use are re-planted in spring, and make a new and tender growth. The small variety, called *German Greens*, is usually sown in the autumn, and cut in spring and sold in the market by measure, somewhat like spinach.



The culture is the same as for cabbage. While we do not anticipate the very general culture of Kale in America, as in many sections of Europe, we think it well to call the attention of our readers to this somewhat noted member of the cabbage tribe.

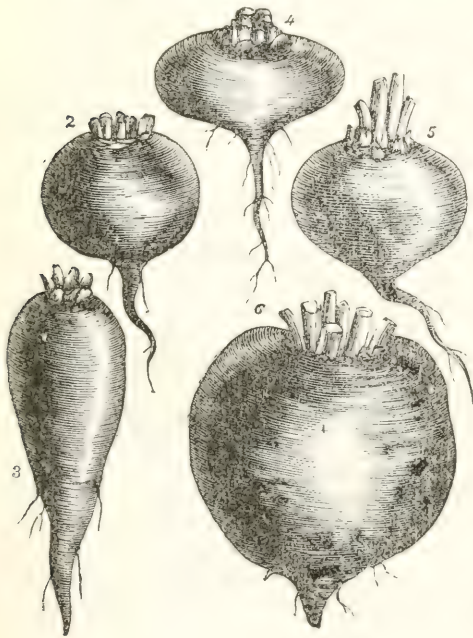
BRUSSELS SPROUTS.

Brussels Sprouts is a very respectable member of the cabbage family, and very nearly related to the Kales. It has a strong stem, sometimes not less than four feet in height, though there is a dwarf variety that never reaches more than half this height. A loose head of cabbage surmounts the stem, and thus a circulation of sap is secured to the extremity, while below, commencing a few inches from the ground line, are numerous small heads like miniature cabbages, so thick as almost to conceal the stem, and presenting the appearance we have endeavored to show in the engraving. These heads are very tender and of good flavor. The culture is the same as for cabbage. If early plants are raised in a hot-bed, they will perfect themselves in September, in the north, and a later sowing should be made in the open ground, that will be in perfection about the time winter commences. These should be taken up and stored in a cool cellar, like the cauliflower, with the roots in earth, where they will remain fit for use during the winter. Where the winters are not very severe, they may remain in the ground to be cut as needed, and in such places the Brussels Sprouts are of the greatest value. In severe climates—climates of great extremes of heat and cold—the Brussels Sprouts, and some other members of the cabbage family, will never be very successfully grown nor become very popular; and yet there are some in every section who will think us over-cautious, and we would not be surprised to receive a package of "Sprouts" from the most unlikely place in the world, just to prove that we are mistaken. The ability and perseverance of some persons will conquer all difficulties, and this is our response, in advance.

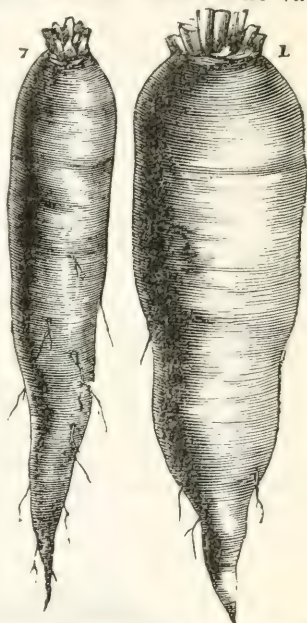


BEETS.

The Beet is a favorite vegetable, and is exceedingly valuable, being in use almost from the time the seed-leaf appears above ground until we are looking for its appearance the next year. The seeds are in little groups or clusters of calyxes, as seen in the little engraving, so that each rounded cluster which we call a seed, really contains from two to four true seeds. The consequence is that the plants come up much thicker than necessary, and must be thinned out. There is nothing in the way of "greens" as good as these young Beets, and the thinnings of the beds can be used as needed, from the time the young plants are two or three inches in length until they are large enough for ordinary use. To preserve the roots in fine con-



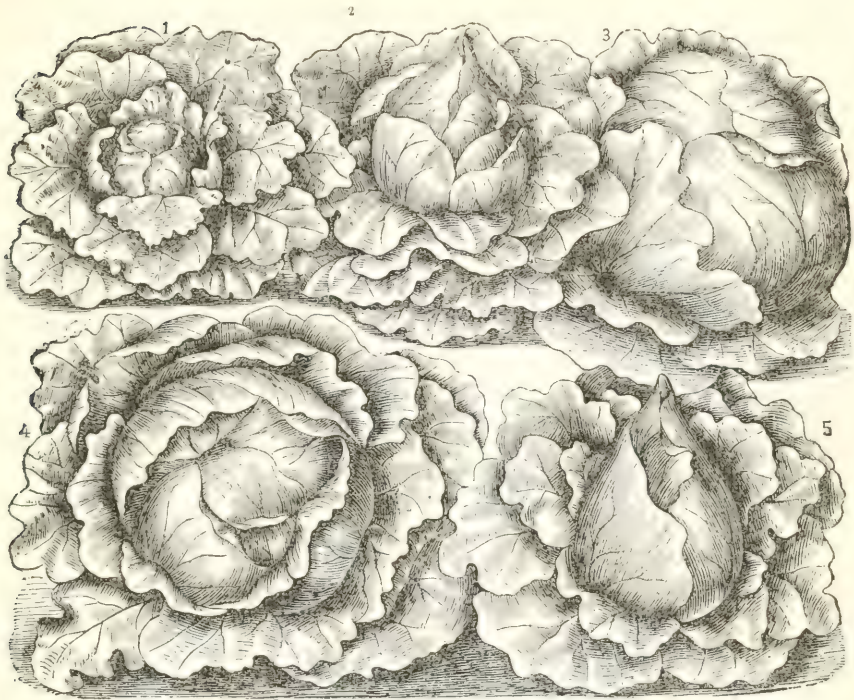
dition during the winter, take them up carefully before hard frosts, and pack them in a cool cellar and cover with earth. For spring use they may be pitted in the ground. The seed germinate more surely and rapidly if put in warm water and allowed to soak for twenty-four hours. The soil should be rich, mellow, and deep. Plant in drills about two inches deep, and the rows about twelve or fifteen apart. Set the seeds in the drills about two inches apart. An ounce of seed will sow about seventy-five feet of drill, and five pounds are sufficient for an acre. The varieties of Beets are very numerous, and quite diversified in form and appearance, from the little round, table, turnip-formed varieties, to the large, coarse sorts, sometimes three feet in length, and fit only for cattle. Figure 1 shows the Large Red Mangel, one of the best for feeding to stock; fig. 2, the Early Blood Turnip, a very smooth, pretty variety; fig. 3, the Pine Apple, a comparatively new and good dark variety; fig. 4, Bassano, an old favorite, juicy sort, tender and light colored; fig. 5, Dewing's Turnip, a week earlier than Blood Turnip, lighter fleshed, and an excellent variety; fig. 6, Carter's Orange Grove Mangel, thought in England to be the best round variety; fig. 7, the old and excellent



Long Blood Red. The *Swiss Chard*, of which we show the leaves, is a variety of Beet cultivated for the broad leaf-stalks, which are cooked and served like Asparagus. Plants should stand a foot or more apart in the rows, and the rows three feet, for field culture.

CABBAGE.

The cabbage requires a deep, rich soil and thorough working. If these requirements are met and good seed obtained, there is no difficulty in obtaining fine, solid heads. For early use, the plants should be started in a hot-bed or cold-frame; but seed for winter cabbage should be sown in a seed-bed, early in the spring. Some gardeners prefer to grow plants for early spring cabbage in a frame in the autumn, protecting them with boards or matting during the winter, but without good care plants saved in this way often prove a loss. In a mild climate, plants may not only be started in the autumn, but transplanted, and will make considerable growth during the winter season. Some varieties seem to do best if the seed is sown in the hills where they are to remain; and this is particularly the case with the *Marblehead* varieties. Sow two or three seeds where each plant is desired, and then pull up all but the strongest. The large varieties require to be planted about three feet apart; the small, early sorts, from a foot to eighteen inches. Always give cabbage a deep, rich soil, and keep it mellow with plenty of manure. For early winter use, store a few



in a cool cellar. The main crop will be better kept out of doors, set in a trench closely, head down, and covered with straw and earth. There is almost an endless variety of cabbage, and nearly all extensive growers have their favorite sorts. Some kinds seem to succeed best in certain localities. The Winningstadt, for instance, which we have shown in figure 2, seems peculiarly adapted to the south. The Jersey Wakefield is now, no doubt, the most popular early cabbage (see fig. 1). Early Schweinfurth (fig. 3), is a very large cabbage, and



matures early, but we have never been able to grow solid heads. Marble-head Mammoth is a large solid cabbage, but requires a very rich soil, early planting and good culture (fig. 4). Fig. 6 is the popular Premium Flat Dutch,

which is the old Flat Dutch somewhat improved, and of American growth. Stone Mason Marblehead is represented by fig. 7, and is an excellent winter cabbage. Fig. 8 is the Drumhead Savoy, a very tender, sweet cabbage, very hardy, and improved by a little frost. Figs. 5 and 10 are the Filderkraut, one of the solidest and best cabbages we are acquainted with; always heads, and as solid as any one can wish.



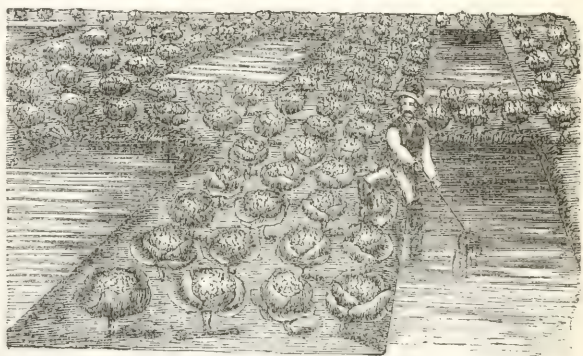
We give two engravings of this fine variety, as the first was drawn from a specimen taken from our grounds when not fully matured. There are several varieties of pickling cabbage, but the highest colored and best is one we introduced several years since from Europe, known as Chappell's Red Pickling (fig 9).



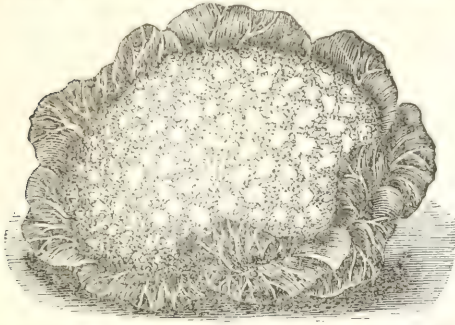
Collards, or what are now known as Collards, are merely young cabbage plants. The usual plan is to sow the seed in drills about half an inch deep, and a foot apart. When these plants are a few inches in height, they are pulled. In the south, sowings can be made through the winter every few weeks. A variety very popular at the south, and thought to be much better than any of the common cabbages, is called *Creole Collards*.

CAULIFLOWER.

The most delicate and delicious of all the cabbage family is the Cauliflower. It is more delicate and tender than the cabbage, and therefore requires a more generous treatment. It delights in a rich soil and abundance of water, which it would be well to apply artificially in a dry season. After seeing the splendid cauliflower growing around Erfurt, Prussia, and observing the pains taken in its culture, I did not wonder that we fail in our hot, dry climate. Cauliflower there is grown in low, swampy ground, which is thrown up in wide ridges. The plants are set on the ridges, and between these are ditches of water. Every dry day the water is bailed from these ditches upon the growing plants, and the result is cauliflower of enormous size, compact, and almost as white as snow. The engraving will give a pretty good idea of these cauliflower gardens, and the process of watering. In the ditches water cress is grown, both for cutting and seed. Still, we must say we have never seen or



heard of finer cauliflower than is sometimes grown in the south and west. The flower buds form a solid mass of great beauty and delicacy, called the "curd," and its appearance is shown in the engraving. This is rendered more delicate by being protected from the sun. Break off one or two of the leaves, and place them upon the flower. Gardeners sometimes sow seed in the autumn, for early cauliflower, and keep the plants over in frames; but by sowing the early varieties in the spring, in a hot-bed or cold-frame, or even in



an open border, they can be obtained in pretty good season. For late cauliflower, sow seed in a cool, moist place, on the north side of a building or tight fence, in this latitude, about the first of May, and they will not be troubled with the little black beetle, so destructive to everything of the cabbage tribe when young. Do not allow the plants to become crowded in the seed-bed. Transplant in moist weather, or shade the newly set plants. In the autumn, plants which have not fully formed the "flower," or "curd," may be taken up and placed in a light cellar, with earth at the roots, and they will generally form good heads; or they may be hung up by the stems, head down, in a cool cellar, and will do well.

A favorite European vegetable, *Brocoli*, resembles the cauliflower; indeed, it is hardly possible to distinguish the two. The Brocoli, however, is the most hardy, and in portions of Europe where the seasons are mild, remains in the ground all the winter, furnishing good heads most of the cold season. Of course, in many sections of our country Brocoli would not suffer in winter, but it dislikes severe summer heat more than cold; and to succeed, it would be necessary to grow late plants, and set them out after the extreme heat of summer is past.

CRESS.

The Cresses are excellent and healthful salad plants, of a warm, pungent taste, and are much relished by almost every one, especially in the spring season. When young and tender the whole plants are eaten, but when older, the leaves only. Cress is often used with lettuce, and other salad plants, and the Curled is very good for garnishing. Sow the seed in a hot-bed or in a sheltered spot in the garden, quite thick, in shallow drills. In a short time it will be fit for cutting. Sow a little every week. The water cress is a great luxury to most people, and cheaply obtained by those who live near fresh water. Scatter a little seed in moist places on the edges of ponds or brooks, and in the eddies of streams, and in a few years the shallow water will be stocked with plants. The engraving with the large leaves shows a branch of Water Cress, and with the small leaves a plant of Curled Cress.



CORN SALAD.

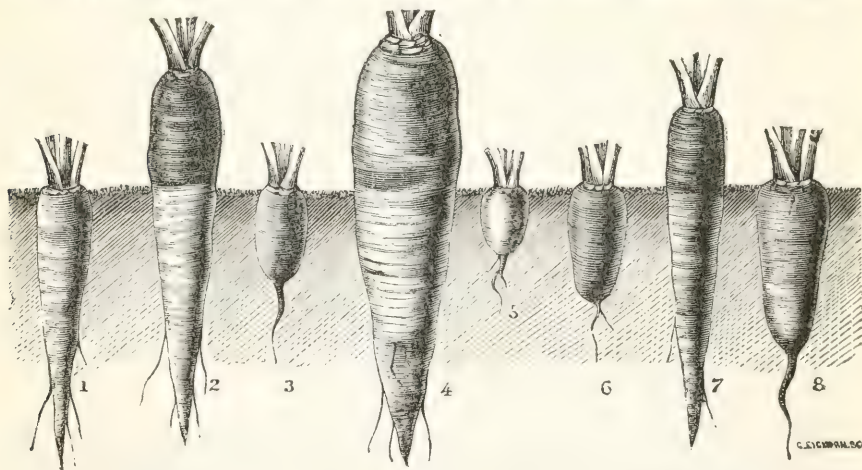
Corn Salad is a favorite salad plant in some portions of Europe, and is much cultivated in America by those who have become familiar with its use across

the sea. Its name is derived from the fact that it is found abundantly growing in wheat fields. Sown in August, and protected by leaves or straw during the winter, it can be used in the spring very early. Sown in April or May, it is very soon fit for use. The leaves are sometimes boiled and served as spinach. It is very hardy. Sow as for lettuce, in rows, covering seed only about a quarter of an inch. Thin out the plants so that they will be three or four inches apart.



CARROTS.

The Carrot should always be furnished with a good, deep, rich soil, and as free from stones and lumps as possible; and if a rather light loam, it is better than if compact and heavy, it is waste of time and labor to try to grow roots of any kind on a poor or unprepared soil. Seed should be got in early, so as to have the benefit of a portion of the spring rains. We knew a part of a field to be sown, when a long rain interrupting the operator, it was not resumed until after the soil had become pretty dry, and no showers coming very soon, the first half sown produced an abundant crop, while the last was almost a failure. Sow in drills about an inch deep, the drills about a foot apart; and at thinning, the



plants should be left at from four to ten inches apart in the rows, according to kind. The Short Horn may be allowed to grow very thickly, almost in clusters. To keep roots for table use, place them in sand in the cellar; but for feeding, they will keep well in a cellar, without covering, or buried in the ground, and any desired for spring use may be pitted out of the way of frost. An ounce of seed will sow about one hundred feet of drill, and two pounds is the usual quantity per acre. For field culture, of course, the rows must be sufficiently distant to admit of running the cultivator between them. The carrot is mostly used in America for soups, and for this the smaller and finer varieties are grown. The carrot is very nutritious and is relished by all animals. The engraving shows the comparative size and habit of growth of most of the leading varieties. Figure 1, Long Orange; 2, Orange Belgian Green-Top; 3, Early French Short-Horn; 4, White Belgian Green-Top; 5, Early

Very Short Scarlet ; 6, Half-Long Scarlet Stump-Rooted ; 7, Altringham ; 8, Half-Long Scarlet.

CHICORY.

Chicory is used in Europe as a salad plant. Seed is sown in the spring, in drills half an inch deep, in a good, mellow soil ; and the after-culture is the same as for carrots. In the autumn, the plants will be ready for blanching. This is generally done by placing a box over them, or by tying the tops of the leaves loosely together, and drawing the earth well up to the plant. The greatest value of chicory is as a substitute for coffee. It has a root something like a parsnip. They are washed clean, cut into pieces that will dry readily, kiln-dried, and then they are ready to roast and grind for coffee. The prepared root is brought from Europe for the adulteration of coffee. An ounce of seed will sow about one hundred feet of drill, and from two to three pounds are required for an acre. The second season the chicory sends up a flower stem three or four feet, bearing pretty, bright blue flowers, which we have shown about half size in the engraving. It is so hardy there is danger it may become a troublesome weed, as it flourishes on the road-sides and in meadows in many places.



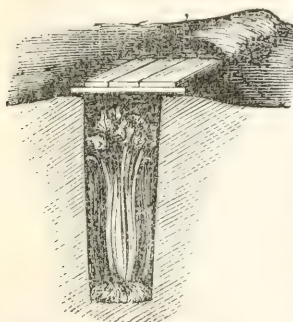
CELERY.

Celery is a luxury that few would like to dispense with, and fortunately there is no necessity for such a sacrifice, as every one who has control of a few feet of ground, with a little skill and industry, can grow a winter's supply. To obtain good celery, it is necessary that the plants should be strong and well grown. Sow the seeds in a hot-bed or cold-frame. When the plants are about three inches in height, transplant to a nicely-prepared bed in the border, setting them about four or five inches apart. When some eight inches high, and good stocky plants, set them in the trenches—about the middle of July is early enough. Too many make trenches by digging out the top soil, and only putting a few inches of mold at the bottom, and never obtain good celery. The trenches should contain at least eighteen inches of good soil and well rotted manure, in about equal proportions. Take off all suckers and straggling leaves at the time of transplanting. Earth up a little during



the summer, keeping the leaf stalks close together, so that the soil cannot get between them ; and during September and October earth up well for blanching. Those who grow celery for market extensively do not use trenches, but make the soil deep and rich, and plant in rows, earthing up with the plow. The time to take up celery is just before hard frost. Dig a trench about the width of a spade and a few inches deeper than the height of the celery. The place selected must be high ground, where no water will be at the bottom, and

where surface water will not drain into the trench. Take up the celery with any dirt that may happen to adhere to the roots. Set the stalks close together, and close to the sides of the trench, but do not press them in. After the trench is filled, place pieces of board or scantling across it at intervals of five or six feet, one of these pieces being shown in the engraving. On these place boards, five or six feet long, covering the entire trench. Then cover the boards with a good body of straw or leaves, with boards or earth on top to keep it from blowing away. The work is then completed. When celery is needed, take up a length of short boards,



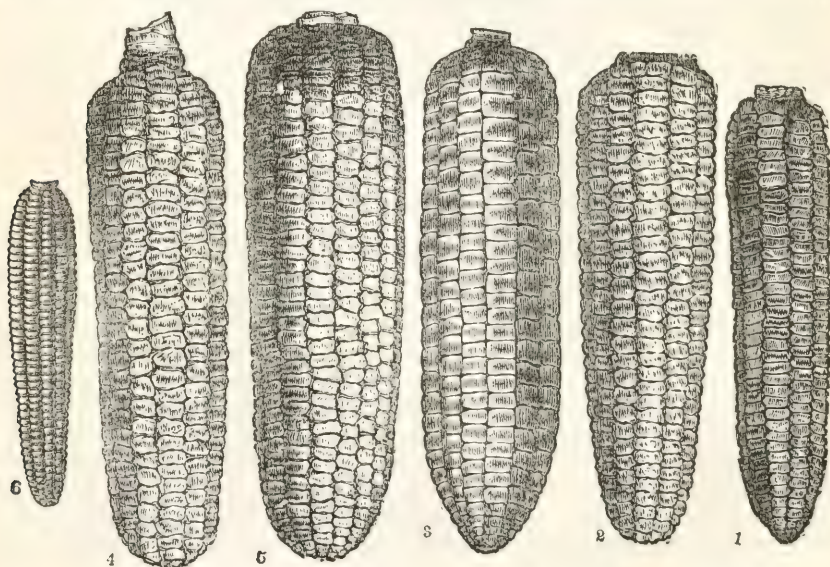
and remove enough celery to the cellar to last a few days, and place it in the coolest part, covered with earth. Replace the boards and covering as before. The dwarf celeries are generally the most solid, sweetest, and really the most profitable. The pink sorts are very pretty as a



table ornament, and as good as the white. The engravings show the general appearance of a well grown celery stalk, also of a variety called Boston Market, of a straggling habit. We also show the Turnip-rooted celery, the bulbous root being prized for flavoring.

CORN.

We need not consume time or space in speaking of the value of good Sweet Corn, nor of its culture. Every sensible person knows the former, and every

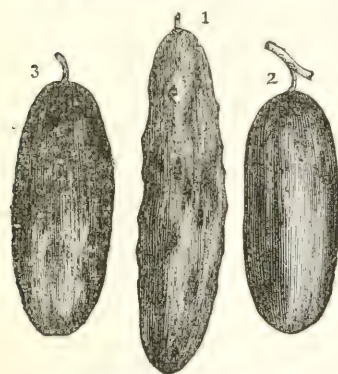


sane one the latter,—at least so it seems to us. A few remarks about varieties is all that will be necessary. The earliest good sweet corn we are acquainted with is the Minnesota (fig. 1.); following in about ten or twelve days, is Russell's Prolific (fig. 2); Moore's Early Concord (fig. 3) is in eating a week or so after Russell's, and Crosby's Early (fig. 4) is in eating about the same time, perhaps a day or two earlier. It is very thick, twelve or sixteen rowed. Stowell's Evergreen (fig. 5) is a magnificent late variety, keeping in eating until frost, almost. There are many varieties of parching corn: one of them is shown in fig. 6, called the White Parching.

CUCUMBERS.

The hardiest varieties—in fact, all the American or common sorts—will produce a medium and late crop, if the seed is sown in the open ground in well prepared hills, as soon as the soil becomes sufficiently warm. In this latitude it is useless to plant in the open ground until nearly the first of June. Make rich hills of well rotted manure, two feet in diameter—a large shovelful of manure, at least, to each hill—and plant a dozen or more seeds, covering half an inch deep. When all danger from insects is over, pull up all but three or four of the strongest plants. The middle of June is early enough to plant for pickling. Make the hills about six feet apart. For early cucumbers, the hot-bed is necessary; but the simplest and surest way to produce a tolerably early crop of the best kinds is, where it is designed to place a hill,

dig a hole about eighteen inches deep and three feet across; into this put a barrow of fresh manure, and cover with a small box-like frame, on the top of which place a couple of lights of glass. When the plants grow, keep the earth drawn to the stems. Water, and give air as needed; and if the sun appears too strong, give the glass a coat of whitewash. By the time the plants fill the frame, it will be warm enough to let them out, and the box can be removed; but if it should continue cold, raise the box by setting a block under each corner, and let the plants run under. The Fourth of July is the time we always remove the boxes or frames. Always pick the fruit as soon as large enough, as allowing any to remain to ripen injures the fruiting of the vine. One pound of seed is sufficient for an acre. There are not very many varieties of hardy cucumbers. Fig. 1 is Improved Long Green, the largest of American sorts, and one of the best; fig. 2, Early Frame, a good variety for table, and for pickling when small; fig. 3, Early White Spine, an excellent sort for table, a great favorite, and forces well; fig. 4, Early Russian, small, very productive, and the earliest of all; fig. 5, Early Green Cluster, next in earliness to the Russian, generally grows in pairs, quite productive and esteemed for pickles. There are very many foreign varieties of very great size and beauty, and of excellent quality, and their general appearance is shown in the annexed engraving. They range in length from eighteen inches to more than two feet, and, when



well grown, are as straight as an arrow. They are called *frame* varieties, because much cultivated in frames or under glass. Some of the hardiest do well in America, if coaxed a little early in the season under boxes covered with glass, as recommended for our hardy sorts. The Long Green Southgate



and the Stockwood we have found the best for the garden in this latitude, but in the south we have no doubt all would succeed admirably. Some persons think because these foreign sorts are large, that they are coarse and scarcely eatable. This is a mistake. They are fine-grained and very solid, having very few seeds, sometimes not more than half-a-dozen perfect seeds in a fruit. Seed, therefore, is always scarce and dear.

EGG PLANT.

A tender plant, requiring starting in the hot-bed pretty early to mature its fruit in the northern states. The seed may be sown with tomato seed; but more care is necessary at transplanting, to prevent the plants being chilled by the change, as they seldom fully recover.

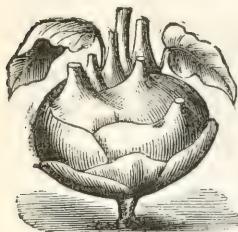


Hand-glasses are useful for covering at the time of transplanting. Those who have no hot-bed can sow a few seeds in boxes in the house. There are various



modes of cooking, but the most common is to cut in slices, boil in salt and water, and then fry in batter or butter. There are several varieties, but the largest and best of all is the Improved New York Purple, an engraving of which we give. The Early Long Purple is the earliest, and valuable on that account, and about eight or nine inches in length. There is an early round variety called Round Purple, and there are several very pretty sorts more ornamental than useful.

KOHL RABI.



Intermediate between the cabbage and the turnip we have this singular vegetable. The stem, just above the surface of the ground, swells into a bulb something like a turnip, as shown in the engraving. Above this are the leaves, somewhat resembling those of the Ruta Baga. The bulbs are served like turnips, and are very delicate and tender when young, possessing the flavor of both turnip and cabbage, to some extent. In Europe they are extensively grown for stock, and are thought to keep better than the turnip, and impart no unpleasant taste to milk. Seed sown for a general crop, in the spring, like the turnip, in drills; or may be transplanted like cabbage. For winter table use, sow middle of June. One advantage claimed for the

Kohl Rabi is that it suffers less from severe drouth than the turnip, and therefore a crop is almost certain. This being so, it must be well adapted to culture in many sections of our country.

LETTUCE.

Lettuce is divided into two classes: the *Cabbage*, with round head and broad, spreading leaves; and the *Cos*, with long head and upright, narrow leaves.



The Cabbage varieties are the most tender and buttery, and the Cos the most crisp and refreshing. In Europe, the Cos varieties are used very generally. They are the most liked by dealers, because they will carry better and keep longer in good condition than the cabbage sorts. There are several varieties with loose, curled leaves, having the habit of the cabbage, though not forming solid heads, and are very pretty for garnishing, but otherwise not equal to the plain sorts. Seed

sown in the autumn will come in quite early in the spring, but not early enough to satisfy the universal relish for early salad. The hot-bed, therefore, must be started quite early. Give but little heat, and plenty of air and water on fine days. Sow a couple of rows thick, in the front of the frame, to be used when young,—say two inches in height. Let the plants in the rest of the bed be about three inches apart, and, as they become thick, remove every alternate one. Keep doing so, as required, and the last will be as large as cabbages. Sow in the open ground as early as possible; or, if you have plants from fall sowing, transplant them to a rich soil, giving plenty of room, and hoe well. We give engravings showing the appearance of the Cabbage, Cos, and Curled varieties.

MARTYNIA.

The Martynia is a hardy annual plant of robust growth, and some of the varieties are somewhat grown as flowering plants.

M. proboscidea produces its curious seed-pods, shown in the engraving, quite abundantly, and these, when tender, are prized by a good many for pickling. They should be gathered before getting fibrous or “stringy.” A little experience will soon make the matter of selecting easy.



MELON.

Those who have their homes a little further south than Rochester, in Maryland, Delaware, Virginia, and in most of our western and all southern States, enjoy a luxury in the melon crop of which many northern people have but little idea. We once very much astonished some kind friends in England because we preferred well-ripened English gooseberries to some melons that had

been procured for our special benefit; but which, though softer, were not much richer than pumpkins. The melon, being a plant of tropical origin, reaches perfection only in a warm temperature, though by a little care in securing a



warm, sandy soil, a sheltered, sunny position, and a little skill in starting plants early, fair crops are grown in what would be considered unfavorable localities. In this latitude we must give the melon every possible advantage to secure earliness and thorough ripening. The same culture as recommended for cucumbers will insure success. The striped bug is the great enemy of the melon and other vines, and the best safeguard is gauze protectors of any simple form that can be easily and cheaply made. There are two distinct species of melon in cultivation, the Musk Melon and the Water Melon. Our engravings show a few of the leading varieties. *Musk Melon*—Fig. 1, Nutmeg; 2, White Japanese; 3, Casaba; 4, Prolific Nutmeg. *Water Melon*—Fig. 5, Black Spanish; 6, Mountain Sweet; 7, Citron, for preserves.

MUSTARD.

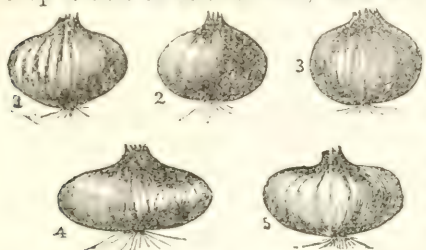
Young Mustard is used as a salad early in the spring, with cress, lettuce, and other salad plants. It can be grown in hot-beds as early as desired, and in the spring, being very hardy, can be sown as soon as the soil is free from frost. Sow in shallow drills, and cut when a few inches in height. It grows very rapidly; but little will be needed, and several sowings should be made at intervals. For a crop of seed sow in early spring, in rows, thin out the plants to six inches apart, making the rows about eighteen inches apart for garden culture, and for field culture far enough for the cultivator. The Chinese is the best for salad, and the Black-seeded is usually preferred for commerce, being stronger than the White; but the White is chosen by many on account of its mildness, and is the kind recommended for medicinal purposes.



ONIONS.

The Onion must have a clean and very rich soil, or it will not do well enough to pay for the trouble. Use well rotted manure freely, and be sure to get the seed in as early as possible in the spring, no matter if it is ever so cold and unpleasant, for if onions do not get a good growth before hot, dry weather, the crop is sure to be a failure; then thin out early, and keep the soil mellow and

clear of weeds, and if your seed is good, you will have a large crop of onions. On no other conditions can you hope for success. The onion is very sensitive, and it won't do to slight it in the least. Sow in shallow drills, not less than a foot apart. When the young onions are three or four inches high, thin so that they will stand about two inches or more apart, according to kind. Disturb the roots of onions

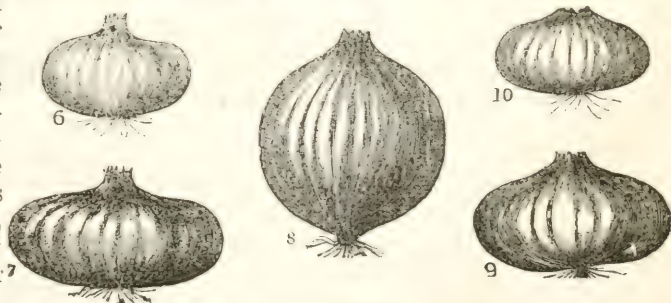


AMERICAN ONIONS.

as little as possible, either in thinning or hoeing, and never hoe earth toward them to cover, or hill, as we do most other things. Four pounds of seed are sufficient for an acre. American onions are quite different from those of Europe; they are generally smaller, with a finer neck, bulb much more freely, are stronger, less sweet, and much better keepers. Our little engraving shows the leading native sorts reduced to quite one-sixth natural size. Figure 1, Wethersfield Red; fig. 2, Early Red; 3, Danvers Yellow; 4, Large Yellow; 5, White Portugal, which is a foreign sort so hybridized or acclimated as to become a native.

As before intimated, while the European varieties of onions lack a great many of the good qualities belonging to the "native Americans," they possess some peculiar to themselves, and which certainly entitle them to favorable notice. They are mild, sweet and large. It is no strange sight to see peasants eat for their dinner, with brown bread alone, and with apparent relish, an onion that would weigh a pound. These foreign onions seem to succeed pretty well in the south. We thought it best to give engravings of a few of the leading sorts. Fig. 6 represents the Large Strasburg; 7, Large Oval Madeira; 8, Large Round Madeira; 9, White Lisbon; 10, Silver-Skinned, the favorite sort for pickles.

For several years past there has been a good deal of excitement among the seedsmen and gardeners of Europe, respecting some new Italian onions of monstrous size, and very mild, superior flavor. Being in Europe when these onions were attracting considerable attention, we saw some of them weighing as much as 4 pounds, and had the best of evidence of their fine flavor. We obtained seed and sent



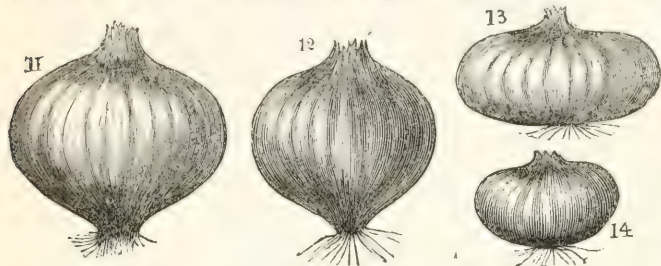
FOREIGN ONIONS.

it all over the country, particularly to the south, for trial. The reports were

generally favorable. The larger kinds, and they are the best, are wonderful in size, beautiful in appearance, sweet, and of pleasant flavor, and excellent for summer, autumn and early winter use. The engravings represent the principal kinds, very much reduced, but show the comparative size and form. Fig. 11, New Giant Rocca of Naples, one of the best; 12, Blood-Red Italian Tripoli; 13, Large White Flat Italian Tripoli, one of the best; 14, Marzajola, very early, but not as large or showy as the others.

To those in the north who would secure a good crop of these onions—and in fact, to all who have difficulty in growing a crop from seed early,—we advise

the following plan: Sow the seed thickly in rows in a hot-bed early. When severe weather is over and the glass is wanted for other purposes, it will not be needed for the onions, as they are pretty hardy. Keep the weeds



NEW ITALIAN ONIONS.

down, and about the time for sowing onion seed, transplant these onions to the open ground, giving them a rich soil and plenty of room. Every one will form a large bulb, and very early. The hot-bed work and transplanting will be some trouble, but the troublesome hoeing and hand-weeding and thinning of young onions will be avoided, which all onion growers know is no small labor. We hope many of our readers will try a few in this way, at least, as we have pursued this course of culture for some years with the most gratifying results. It is doubtless known to most of our readers that it has been considered difficult to grow onions from seed at the south, because the warm weather checks their growth before bulbs are formed. The hot-bed plan suggested we think will remedy this evil, but the one usually pursued is to plant what is called Onion Sets. These are small onions, about the size of large peas. The seed is sown in the spring in broad rows, in a poor soil, and very thick, where they have not space to make a fair growth. About twenty-eight pounds of seed are sown to the acre. The result is a large quantity of stunted onions, that are taken up in July and dried thoroughly on the ground. They are then stored away to be sold for planting the following spring. These, when planted in the spring, produce good onions, and are used extensively in the south. It is, of course, a good deal of labor to raise a bushel of these little onions, and they generally sell at high prices, from \$10 to \$15 a bushel.



POTATO ONION.

Another onion very largely grown by those who cannot succeed with seed, or who want early green onions, is the English Potato Onion, which is the best underground variety. A large onion produces, the first season, under ground, a large cluster of onions, like that shown in the engraving, but the size is reduced. Many of them, with good culture, will be half the size of ordinary onions. These are put out in the spring, and very early they are ready for use as summer onions, and are a great favorite with market gardeners. It is this

sort that is usually sold in bunches in the markets. Those that are allowed to remain in the ground during the summer make very large bulbs, to be sold or replanted the next spring for small onions. They are rather poor keepers, and the practice here is to spread them on the floor of a barn-loft and cover with straw, where they will freeze and keep frozen all the winter. They will then be in pretty good condition, but if kept in a warm place they must be turned every day, or they will rot, as they will if subjected to frequent freezing and thawing. If they were good keepers they would be very popular. The price is always high, generally about \$5 a bushel.



TOP ONIONS.

Another variety not so good or so popular as Potato Onion, is the Top Onion. When large onions of this sort are planted, each one sends up a strong stem, just like the seed-stem of the common onion, but instead of bearing on its top a number of seeds it produces a cluster of small onions, just as we show in the engraving. Next spring these small onions are planted, and each one produces a full-sized onion. They can be eaten during the summer, and are often sold in bunches, or they can be kept for winter use for spring planting. Each of these large onions, of course, produces a cluster of small ones after a season's growth. Onion culture has become such an important interest, throughout our country, and in fact, throughout the civilized world, that we thought it important to give pretty thorough information on this subject.

OKRA.

This vegetable is a native of the West Indies, though now grown in almost all warm countries. Its green seed-pods are used in soups, to which they give a jelly-like consistency, as they abound in mucilage, like all of the Mallow family. It is considered very nutritious, and exceedingly grateful to stomachs not over strong. The common name south is Gumbo. It is of the easiest possible culture, and bears well. North it would be best to sow the seeds in hot-beds, and transplant, except in favored localities. There are two varieties generally grown, known as dwarf and tall. The Okra is a vigorous, large plant, requiring a good deal of room, and the large kind should be planted not less than three feet apart, and the dwarf about eighteen inches. In mild climates it is only necessary to sow the seed in the open ground, about two inches deep, and then merely keep the ground clean and mellow, as for a hill of corn. We have grown good Okra here by sowing in the open ground early in May, in a warm exposure and soil.



PARSLEY.

Parsley is a hardy biennial plant, and therefore is in use two seasons, but about the middle of the second summer it goes to seed, so that sowings must be made every second year. Parsley seed germinates very slowly: it should be started in a hot-bed if possible. For out-door sowing always prepare the seed by placing in quite hot water and allowing it to soak for twenty-four hours in a warm place. When the plants are a few inches in height, set them in



rows, three or four inches apart. Parsley makes a pretty edging for the walks of the vegetable garden. As but little generally is needed, if sown in the garden in rows, it will be only necessary to thin out and destroy the surplus plants. Parsley is a universal favorite for soups, and for garnishing there is nothing so good as some of the best kinds. Indeed, it has been recommended and used for bouquets; but one poor gardener tried it only once, for he was coolly informed by the lady that she wished a bouquet for the parlor, and not herbs for the kitchen.

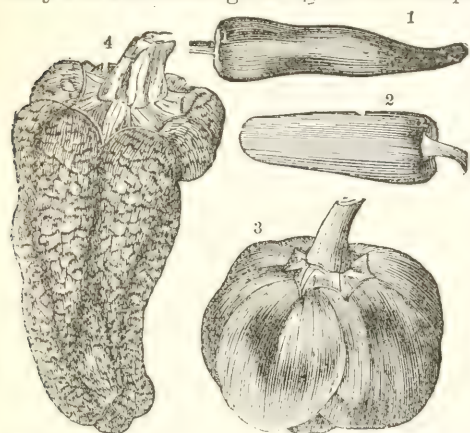
PARSNIPS.

The Parsnip flourishes best, and gives the longest, largest, smoothest roots in a very deep, rich soil,—one that has been made rich with manure the previous year. Manure, especially if fresh, makes the roots somewhat ill-shaped. Sow as early in the spring as the ground can be made ready, in drills, from twelve to eighteen inches apart, and about an inch deep. Thin the plants to five or six inches apart. An ounce of seed will sow one hundred and fifty feet of drill very thickly. Six pounds of seed is the usual quantity sown on an acre. The part of the crop required for spring use can remain in the ground during the winter. If a portion is covered heavily with leaves, they can be dug at any time. A few can be stored in a pit or cellar. For feeding cattle no root is superior to the Parsnip. In the island of Guernsey, a few years ago,—and perhaps the same state of things still exists,—pigs and cattle were almost or entirely fattened on this root. We have always thought that American farmers did not realize the value of this root. In field culture it would be advisable to make the rows wider apart, so as to admit the cultivator one way. Although from the ease with which corn is grown, particularly in the western states, it has been thought that there is no great necessity for the culture of roots in this country, we have no doubt that their more general growth would be of material advantage in many ways, especially in the older sections of the country. Animals always thrive better, and are more healthy, on a somewhat mixed diet in which roots form an important part. This fact our best farmers are fast learning. As the Parsnip is not injured by frost it seems well adapted to general culture. Every one who visits any of the agricultural exhibitions of Canada, must notice the great attention given to root culture in that country, as shown by the quantity and quality of those exhibited. There are several varieties of Parsnips, but we have found little difference, and the old Hollow Crown seems as good as any. Roots that are allowed to remain in the ground during the winter are better flavored than those dug in the fall. As the roots go very deep, and seem to have an unusually firm hold of the soil, if they are carelessly dug more than half will be broken, which is a great injury to the crop.



PEPPERS.

There are perennial shrubby or woody peppers, and very beautiful plants they are when seen growing in their tropical homes. What we cultivate is an



annual species from India. The pod or fruit is in demand in every kitchen, and very large quantities are grown to supply our large cities and the manufacturers of pickles, and it is used somewhat freely in medicine. Sow the seeds early, under glass, if possible, and transplant only when the weather has become steadily mild. If no hot-bed is to be had, prepare a seed-bed in a warm place in the garden, and sow, in the middle and northern states, in May, and transplant when the plants are about three inches in height. As usually only a few plants are needed, it is

well to sow the seeds where the plants are to remain, and thin them out to about a foot apart. The fruit is often used green, but will be ripe in September. There are several varieties, ranging in height from one to three feet, while the fruit varies from the Little Cayenne to the great French Monstrous, six inches in length. Fig. 1 shows Long Red; 2, Cayenne; 3, Tomato-formed; 4, Monstrous, or Grossum. The Large Bell, and several other large sorts, differ little from the Tomato-formed, but larger. The Sweet Mountain, or Mammoth, is very large, mild, with thick flesh, and is pickled stuffed like mangoes. The engraving shows Cayenne of natural size; all others are very much reduced.

PUMPKINS.

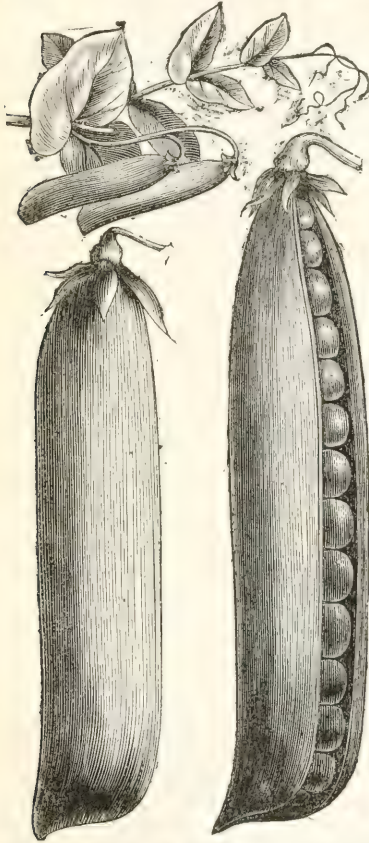
The Pumpkin is now but little used, except for agricultural purposes, the squashes being so much sweeter and drier, and finer grained. No good gardener, we think, would tolerate a pumpkin in the garden, nor would any sensible cook allow one in the kitchen. Those monster kinds that we see occasionally at our fairs are the worst of all. The farmer, however, finds the pumpkin a very serviceable addition to his fall feed, and probably as long as maize is grown in America the golden pumpkin will gild our corn fields in the beautiful Indian summer days of autumn. After all, a good many will think what we say of the pumpkin all nonsense, and perhaps it is. We shall not certainly disagree about so small a matter as a pumpkin, and some persons will always defend the good, old-fashioned pumpkin pie against all innovations.



PEAS.

The pea is very hardy, and will endure a great amount of cold, either in or above the ground; and as we all want "green peas" as early as possible in the season, they should be put in as early as the soil can be got ready,—the sooner the better. Peas are divided by seedsmen and gardeners into three classes,

Early, Second Early, and Late. The earliest are mostly small, round, smooth, and hardy, the tallest not growing more than from two to three feet in height. Of late years some very fine dwarf, sweet, wrinkled sorts, like Little Gem, have been added to this class, of very great merit. The *Second Early* contains a list of excellent wrinkled varieties, like Eugenie. The *Late* are large, mostly



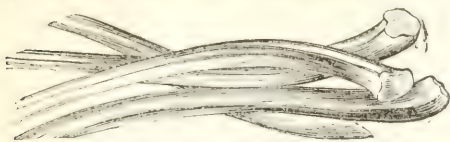
wrinkled, and formerly were nearly all tall, like the Champion of England, but very many excellent dwarfs have been added to the list, like Yorkshire Hero. If the *Earliest* sorts are planted about the first of April, in this latitude, they will be fit to gather in June, often quite early in the month. The *Second* will come in about the Fourth of July. By sowing two or three varieties of *Early*, and the same of *Second*, and *Late*, as soon as practicable in the spring, a supply will be had from early in June to late in July, with only one sowing. After this Sweet Corn will be in demand. Sow in drills not less than four inches deep, pretty thickly,—about a pint to forty feet. The drills should not be nearer than two feet, except for the lowest sorts. Those growing three feet high, or more, should not be nearer than three or four feet. As they are early off the ground, cabbage can be planted between the rows, or the space can be used for celery trenches. All varieties growing three feet or more in height should have brush for their support. The large, fine-wrinkled varieties are not as hardy as the small sorts, and if planted very early should have a dry soil, or they are liable to rot. Keep well hoed up and stick early. When grown extensively for market, Peas do well sown on ridges made by the plow, two rows on each ridge, and not

sticked, the pea vines drooping into the furrows. In response to the inquiry so often made, why we can not sow Peas late, and thus have them in eating all through the summer, and why Peas are “buggy,” we will say that the Pea delights in a cool, moist climate, and suffers in warm, dry weather. Those planted late will most likely be attacked with mildew, and never give half a crop. The Pea, when grown in a tolerably mild climate, is troubled with a weevil, the egg being laid in the pea when it is very small, through the pod. The way to obtain sound Peas for seed, is to grow them where the weevil does not exist.

RHUBARB.

The Rhubarb, or Pie-Plant, is usually grown from divisions of the roots, for every portion which has an eye, will form a plant. Occasionally persons prefer to grow from seeds. It will take two years to obtain a strong plant from seed, but a package of seeds in two years will give enough plants to stock

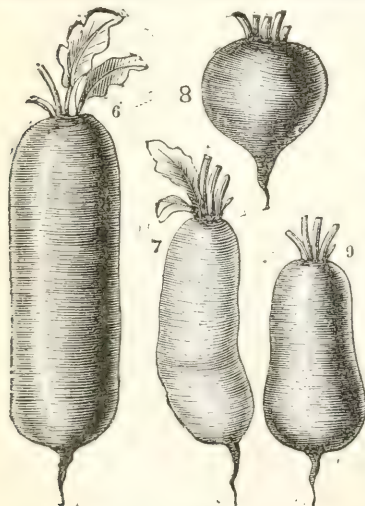
a neighborhood. Give a good, rich, deep, mellow soil, both to seeds and plants. In the spring, two weeks before the frost is gone, cover two of the finest roots with barrels. Then throw over the roots and around the barrels leaves, straw or manure, and the earliest and tenderest stalks will be the result.



RADISHES.

Radishes are divided into two classes, Spring and Winter, or as denominated in some of the books, Summer and Autumn. The spring varieties are much smaller than the winter, tender, arrive at maturity in a very brief time, and very soon become over-grown and worthless. The winter sorts mature more slowly, are large, very solid, and with proper care keep a long time.

The Spring Radish must make a rapid growth to be fit for use; it will then be crisp and tender, and of mild flavor. If grown slowly, it will be hard, fibrous, and disagreeably pungent. For early use, seed should be sown in the hot-bed, in drills four or five inches apart and half an inch deep. Thin out the young plants so that they will stand two inches apart in the rows. Give plenty of light and air, or they will become drawn—that is, slender and worthless.



For out-door beds, select a warm, sunny location, with a sandy soil. A little new earth from the woods, as a top-dressing, before the seeds are sown, will be of great service. A top-dressing of soot, or even coal ashes, will be of much benefit, as we have found by long experience. The great point is to get the plants to grow rapidly after the seed-leaf appears above ground, so as to be out of the way of the black beetle that proves so troublesome when they are young, puncturing every leaf. Sow soot, ashes, or dust over them frequently, as the beetle dislikes gritty food. Our engraving shows a few of the leading varieties, fig. 1 representing Red Turnip; 2, Rose Olive-Shaped; 3, Scarlet Olive-Shaped, with white tip; 4, Long White Naples, an excellent variety for growing late in the season; 5, Long Scarlet Short-Top.

The Winter Radish should be sown in July or August, about the time of turnip sowing. They may be kept in a cool cellar and covered with earth for winter use. Put them in cold water for an hour

before using. The engraving represents the principal varieties of winter radishes—indeed, all worthy of culture. These radishes are every year becoming more popular, and particularly so since the introduction of the newer Chinese varieties; though for that matter we are indebted to China for all our radishes. Fig. 6 is the California Mammoth White Winter, a splendid variety which we saw in San Francisco, more than a foot in length, and as crisp and tender as one could desire. It was brought to California by Chinese emigrants. Fig. 7, Chinese White Winter; 8, Black Round Spanish; 9, Chinese Rose Winter.

SALSIFY, OR OYSTER PLANT.

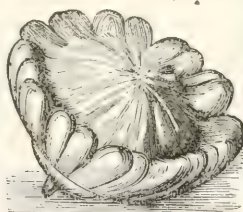
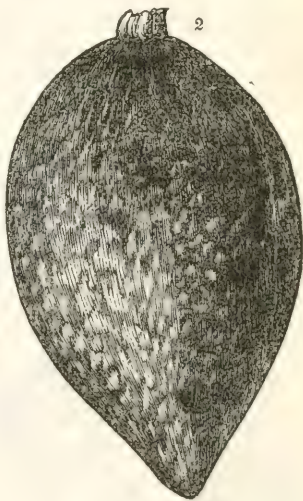
A delicious vegetable. Cut into small pieces, it makes a fine soup, like that from oysters. It is also par boiled, grated fine, made into small balls, dipped into batter, and fried. Culture same as for carrots and parsnips.



SQUASHES.

The Squashes are an interesting and useful class of vegetables, interesting because presenting such a variety of forms. Of their usefulness we need not say a word. The squashes are of tropical origin, and therefore it is useless to plant them until the soil is quite warm, and all danger of frost or cold nights is over; and as they make a very rapid growth there is no necessity of haste in getting the seed in the ground. We usually divide the squashes into two classes, Summer and Winter. The Summer squashes are eaten when the rind and flesh are tender, about mid-summer. The best of this class are the Crook-

Neck and Scollop, and these are what are called bush varieties, and do not run. The Winter squashes are allowed to ripen thoroughly before gathering, and are then stored away for winter use. A good, cool cellar will preserve these winter squashes until May, if well ripened. The winter varieties are all runners, we believe.

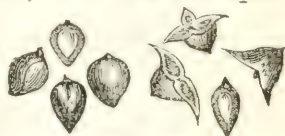


The best winter squash is the Hubbard, fig. 1, and if pure and well ripened, and decently cooked, it is almost as good as a sweet potato. Fig. 2 represents the Marblehead, another excellent winter squash, but we think hardly equal to

the Hubbard. Fig. 3, Scollop, or Pie-formed, a good sort, and liked by market gardeners, because the rind is somewhat hard, and it bears shipping well. Fig. 4 is the excellent summer Crook-Neck, one of the best, if not the best, of the whole race of summer squashes. Squashes are good feeders, and like a rich soil: it is best to manure in the hill. Sow a dozen seeds in each hill, and when danger from "bugs" is over, pull up all but three or four. A mellow, warm soil is best. For bush sorts, make hills three or four feet apart, and for the running kinds twice this distance.

SPINACH.

To grow Spinach in perfection, the soil must be rich. Sow in the autumn for spring use, in good drained soil, in drills a foot apart. As soon as the plants are well up, thin them to about 3 inches apart in the rows. Covering with a little straw or leaves before winter is useful, but not necessary. For summer use, sow as early as possible in the spring. There are two popular varieties, the principal distinction being that one has a round seed, and the other with sharp points, and called prickly. These we have shown in the engraving.



TOMATOES.

The Tomato is more generally used in America than in any country in the world. The amount consumed seems wonderful, especially when we consider how brief the time since its first introduction as an article of diet. Almost every one likes it, and most persons regard it as a great luxury; but the To-



mato is so slow perfecting its fruit that it is quite after the middle of summer, and at the end of most people's patience, before the ripened fruit can be enjoyed. To obtain early varieties, therefore, is the great desire of all, and it is no strange thing to have varieties advertised as two weeks earlier than any other

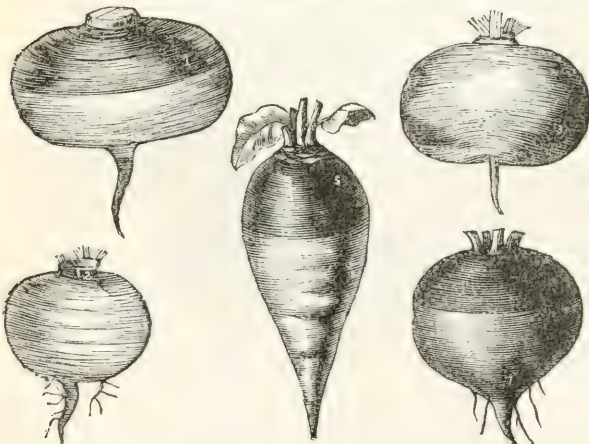
kind, that are entirely worthless in all respects, not even having the merit of earliness. We are satisfied that Hubbard's Curled Leaf is the earliest Tomato grown, and this is its only merit, for it is small and far from being smooth. The plant is small and will bear close planting, the leaves curling as if wilted. Gen. Grant is an excellent early Tomato, about ten or twelve days later than the Curled Leaf, but Hathaway's Excelsior is as early as Gen. Grant, and the best Tomato we are acquainted with. It received a certificate of merit from the Royal Horticultural Society of England, is pronounced by the press of Europe the best variety produced, and is everywhere popular. It is smooth, solid, of good flavor, excellent color, and productive. Pinching off a portion of the side branches, and stopping others beyond where the fruit is formed, hastens the ripening very much. To obtain plants early, sow seed in the hot-bed early in March. In about five weeks they should be transplanted to another hot-bed, setting them four or five inches apart. Here they should remain, having all the air possible, and becoming hardened, until about the middle of May, when they may be put out in the ground; that is, if there is no danger of frost. Very good plants can be grown in boxes in the house, starting them even in the kitchen. Those, of course, who live in a southern clime will be spared a good deal of this care. The soil for early Tomatoes should not be too rich, and a warm, sheltered location selected, if possible. The Tomato may be made very pretty by training on a fence or trellis, like a grapevine. No plant will better bear trimming. We have tested hundreds of varieties of Tomatoes in our grounds during the past ten years. Every season we put on trial every new kind we can obtain from any source, and feel quite competent to speak on the subject. Still, we can judge well of the influence of soil and climate only as we receive reports from our friends in different sections of the country.

The engraving, fig. 1, represents the Cherry Tomato, useful only for pickling; 2, Persian Yellow; 3, Hathaway; 4, Gen. Grant; 5, Early Smooth Red; 6, Curled Leaf. All are, of course, very much reduced in size, though very well representing the form and characteristics of each.

TURNIPS.

There are two quite distinct species of turnips grown, one called the *English*

Turnip, and the other the *Swede* or *Ruta Baga Turnip*. As they require somewhat different treatment, serious mistakes are sometimes made on that point. In ordering seeds, care should be taken to state which kind is desired. The English Turnip, if designed for early use, should be sown as soon as the ground can be prepared in the spring, so as to have the benefit of early showers, for the Turnip will not grow in dry, hot weather. For

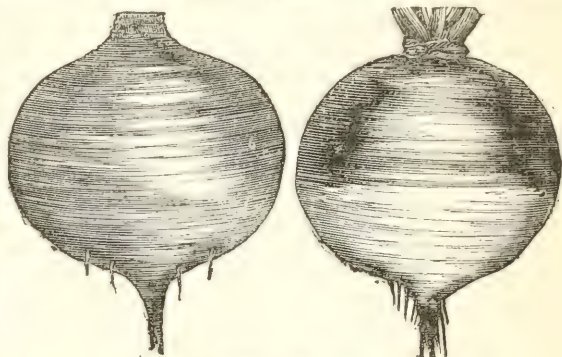


ENGLISH TURNIPS.

the main crop, for fall and winter use, sow in August, and the plants will have the benefit of the autumn rains. If the weather should prove dry, the crop will be light. The soil for Turnips should be rich and mellow. Sow in drills, from twelve to eighteen inches apart, and half an inch deep. When the plants are a few inches in height, and strong enough to resist the attacks of insects, thin them out to some five or six inches apart in the drills. Two pounds of seed are sufficient for an acre. Fig. 1 represents the Strap-Leaved Purple-Top; 2, Orange Jelly; 3, Yellow Malta; 5, Jersey Navet; 7, White Norfolk.

The Swede, or Ruta Baga Turnips are large, very solid, perhaps the most solid vegetable that grows.

The flesh of nearly all the varieties is yellow. They do not grow as rapidly as the English Turnips, and should be sown as early as the first of June. The rows should be about eighteen inches apart, and the plants in the rows not less than ten inches. The engravings show, fig. 4, Carter's Imperial Purple-Top; fig. 6, Green-Top. We do not suppose that a warm, dry climate will ever be con-



SWEDE TURNIPS.

sidered favorable to Turnip culture, and yet we never saw better crops in the most favored districts of England than we have seen in America. It is only in exceptionally dry seasons that our crop fails, with good culture. A soil rich in phosphates is necessary for a large crop, hence all bone manures are exceedingly valuable. With proper Turnip food and a moist season success is almost certain. There is only one enemy to be conquered. The little black flea, or Turnip Beetle, is very destructive when the plants are in the seed-leaf; but with a fair season and a rich soil the plants are soon in the rough leaf, when they are troubled no longer. Some good farmers sow twice the usual quantity of seed, and in this way save plenty from the little enemy; and this, we have no doubt, is the safest and most economical way, for it is better to feed them on plants that we do not need than on those upon which the crop depends.

SWEET AND POT HERBS.

A few fragrant, or, as they are sometimes called, Sweet or Pot Herbs, constitute a little treasury upon which the house-keeper will find occasion to make almost constant drafts, and these will be honored from early summer until autumn. A good reserve can also be stored in some closet or store room for winter use. As a general rule it is best to cut herbs when in flower and dry in the shade, and they dry more evenly and in better shape if tied up in small bunches and hung in the shade. For soups and dressing for poultry these herbs are a necessity in the estimation of most persons, while as domestic medicines several kinds are held in high repute. The Sage and its uses, of course, every one is acquainted with. The Broad-leaved English is the best. Thyme, fig. 2, is of universal cultivation, as is also Summer Savory, fig. 3. Rosemary, fig. 4, is a very fragrant herb, and is everywhere popular. Borage, fig. 1, is a beautiful plant, with azure-blue flowers, pretty enough for any flower garden. It



is much used in Europe for flavoring claret and other wines. We give a list of the herbs generally cultivated and prized, either by the cook or the nurse.

Anise,	Cumin,	Marjoram, Sweet,	Savory, Winter,
Balm,	Dill,	Rosemary,	Thyme, Broad-Leav'd
Basil, Sweet,	Fennel, Large Sweet,	Rue,	English,
Borage,	Hoarhound,	Saffron,	Thyme, Summer,
Caraway,	Hyssop,	Sage,	Thyme, Winter,
Coriander,	Lavender,	Savory, Summer,	Wormwood.

A very small space in the garden will give all the herbs needed in any family. The culture is very simple, and the best way is to make a little seed-bed in the early spring, and set the plants out as soon as large enough in a bed. The trouble, therefore, is trifling, while the expense is comparatively nothing, as a paper of either can be obtained for five cents, and will contain more seeds than any one will be likely to need. In a mild climate some kinds will live over the winter, but they are so easily grown from seed that saving old plants is not of much consequence.



INAUGURATION OF "THE MICHIGAN PEACH BELT."

BY AN OLD SETTLER OF BERRIEN COUNTY.

The "Peach Belt" was inaugurated in 1847, and this is the history of my part in it:

At that time farmers here and there about St. Joseph, as in other of the then settled parts of the State, had a few peach trees of seedling sorts, generally in fence-corner rows, rarely in orchard form. A Mr. Pike of Royalton, E. Morton of Benton, and John Byers of Bainbridge had what other people thought a very profuse supply, and were the first to sell anything like a wagon load. The improved varieties of that day in that part of the State were "Pike's Seedlings," afterwards called "St. Joseph Yellow Rareripe," and Byers' "Red Rareripe," also a seedling with him. L. L. Johnson, living near what is called the Gap, also had a large supply of seedling peaches. A few years before, Mr. B. C. Hoyt of St. Joseph started a nursery and had fruited apples, pears, peaches, plums, and cherries. His stock of peach trees was quite limited, running heaviest on apple and pear. I know of no peach orchard set from that nursery. About this time (1847), pits of the peach known as Hill's Chili, Stanley, and other names, were planted by Mr. McKeyes of Bainbridge.

At that time I owned an eighty-acre lot of rich soil in the same town, and had planted on it that spring a small orchard of budded peach trees, which I had bought of Col. Hodge's "Buffalo Nursery." Becoming satisfied that my place would prove too frosty for fruit purposes, I began to canvass for a better place. From friends living west of Lake Michigan, and from occasional newspaper reports of the "cold snaps," I became satisfied that peaches would not be raised west of the lake. I knew Mr. Hoyt had kept a thermometer for several years, and so far as I knew, his was the only one in St. Joseph. To him I went to learn what the winter extremes had been. He made the sweeping assertion that it had never gone below zero. I could hardly believe it, but he was positive. That supposed fact, for which the reason was very apparent in the unfrozen waters of Lake Michigan, decided me, and before I had walked home the nine miles I had decided to go on to the lake shore. The next day saw written notices of my farm for sale, and in a few days a man appeared who paid my price in gold. I immediately procured a chart from the Land Office at Kalamazoo of all the lake shore from St. Joseph to the Indiana line, which

was then without a settler on the shore between New Buffalo and St. Joseph (called twenty-eight miles). A part of the land still belonged to the Government. Not liking to face such a solitude alone, and having but little to do with except my hands, I proposed to my friend A. S. Woodruff to start a peach orchard on the lake shore in partnership, explaining to him, as well as I could, the advantages of the water protection, and a market on the other side of the lake. He thought enough of it to go with me on an exploring expedition. So, with our chart, a spade, and some provisions, we set out. We reached New Buffalo the second day, passing the night in a deserted shanty. We were neither of us quite satisfied, placing great stress on the quality of land. We found some good land, but before we could trace out at any one place directly on the shore a good sized farm for each of us we ran into broken or poor land, oak openings in those days not standing high in our estimation, unless they were burr oak. Returning disappointed to St. Joseph, I thought as I strolled out on the bluff where the Hoyt House now stands, "perhaps I have sold myself out of home." Looking across the one and a half miles of sand hills north of the mouth of the river to the dark forest on the bluff beyond, indicating timbered land, I reasoned to myself, "If there is any good land there some day there will be a road to it;" for at that time there was not a settler's clearing on the shore from those sand hills to South Haven, though there were several along the Paw Paw river and between the river and lake; and to reach that bluff by road it was eight miles travel, as we had to go up the river a long way to a bridge and then take the road down the other side of the river. My friend concluded to go with me, and we were put across the river in a skiff, passed over the sand hills, and went on to the timbered bluff. Traveling near the front of the bluff, keeping in sight of the lake, we found good land, but too broken to suit our large ideas. If we could then and there have taken a Rip Van Winkle sleep, to awake to-day and behold the Fruit Paradise of my old neighbor Wm. J. Nott, we would have been led to rub our eyes and butt our heads to dispel the illusion, for no tired dreamer ever fancied such a metamorphosis.

We passed along until we came to the top of the ridge at a point between the house now owned by Mr. Morely and the bluff. From this point we looked down into a tall forest of oak, ash, elm, bass, maple, and butternut. I for one was ready to say Eureka! The surface was just right, and such sights of rail timber! I don't remember that I saw a bit of the hard work necessary to clear it. I was a happy man. A little further on we came to a roll-way where logs had been rolled down the bluff. Taking the track which led away from it, about half a mile from the shore we found a small clearing and a log house. The place was for sale, and the owner was in Valparaiso, Indiana. After tracing out the lines, the next day I started on foot to find the owner, and the purchase was made. The tenant soon moved off, and on the first day of November my family was domiciled in that log house. At this time there lies in sight from the ridge where I first got sight of that tall timber, 163 acres of land which I cleared with the work of my hands and the products of that farm, and out of that rail timber I had at one time a mile of fence which was too high for a deer to jump. This was necessary in the fall to keep the bucks from rubbing and twisting my fruit trees with their horns, and from the same point there is now in sight ninety-eight acres of orcharding of my setting.

Well, the next spring (1848) I had two and a half acres cleared, fenced, and planted with trees. Apple two rods apart each way, with peaches and a few

pears and plums in rows both ways between, and also a few quinces. These trees were purchased in part of "Buffalo Nursery" and part of McIntosh & Co., of Cleveland. The Crawford peaches were then a new thing to both those nurseries, and no trees could be had of those sorts, except in the dormant bud. I bought in the bud two of each, of each of the two nurseries, and the fall of the same season I was able to bud largely from those eight Crawford trees. I think that was the beginning of Crawford peach culture in Western Michigan. The next year Capt. Boughton set near St. Joseph village 130 trees, not as Mr. Winslow in his "History of St. Joseph" says, "more as an experiment than the expectation of making much profit." I believe every man, if decently successful, likes to have the credit of not blundering into his business. Mr. Winslow forgot that those were days of small things.

In 1852 Mr. Boughton set out seven acres more. In 1849 I set a few more trees near the old log house. Those were Morris' Red Rareripec and Bellegarde. In the spring of 1850 I set as I suppose the first Crawford orchard ever planted in the Fruit Belt, raised from the eight trees set in the dormant bud two years before, setting of different varieties about four acres. In 1851 I set two and a half acres more. In 1850 (I think it was), Mr. E. Morton put out something of a peach orchard in addition to his fence corner trees, and shortly after Dr. Talman Wheeler set what is known as the Teetzel orchard. At this time nearly all the older farms had seedling trees bearing, and those men who had a surplus above their own wants began to sell at what they thought good prices. It was not until after Mr. Boughton and I sold choice peaches from our imported trees that there was much else than seedling trees planted or budded trees from the better class of local seedlings. The St. Joseph Yellow Rareripec, or Pike peach, was Mr. Morton's favorite sort, so much so that for several years it was usually called Morton's Yellow Rareripec, and it was a profitable peach with him. He and I both raised Hill's Chili from pits from the McKeyes trees.

The first great impetus to peach planting was given when I contracted my first considerable peach crop for \$1,500, to be delivered in St. Joseph. Money was scarce in those days, and for such a sum to be raised off a small farm was a very great wonder. The report went over the country, and was magnified ridiculously; but it did its work, though my contractors failed in a way to subject me to a serious loss. From those days advancement has been rapid, and every town on the lake shore now has its peach history.

SMALL FRUITS.

BY JEREMIAH BROWN, OF BATTLE CREEK.

RASPBERRIES.

After a trial of many varieties for a long time, I have abandoned the cultivation of any but the Philadelphia and Clark (both red), and the Doolittle, and an accidental seedling discovered on my farm in 1865. These are both blackcaps, and are perfectly hardy except in such fearful winters as that of 1874-75.

The Clark is a newer and much better variety than the Philadelphia. It must, however, be placed among the half hardy, which is a serious objection.

My seedling is far superior to the Doolittle in quality and productiveness, but is about two days later in ripening.

For field culture the stools should not be less than five feet apart each way, but in the garden four feet will do.

The Raspberry luxuriates in a rich soil, and will not tolerate the company of grass and weeds: clean cultivation throughout the summer is of the utmost importance if you wish to secure an abundance of fine, large fruit.

In planting, cut the top off to within two inches of the ground, and never set the plants any deeper than they stood before taking up; mulch with coarse manure, but do not cover the plants; they will not require pruning the first season; the next spring cut the canes back to within two feet of the ground and the laterals to within twelve to sixteen inches, according to size. From three to four canes in a hill is better than more.

The second year the canes may be left from three to four feet long, and no longer if you want fine, large berries.

A good mulch of straw or coarse manure is very desirable every spring. It tends to enrich the soil and retain the moisture in dry summers. A good authority says that thorough cultivation is the best mulch in a dry season. I have found both very beneficial.

THE BLACKBERRY.

I have often been requested by different parties to give my opinion as to which is the best Blackberry,—taking into consideration quality, hardiness, and greatest fitness for market purposes. Having tested thoroughly all the

best varieties except the Snyder (which I am now testing), I do not hesitate to give the Lawton a decided preference.

I know very well that the dealers generally claim that the Kittatinny is perfectly hardy, but I have not found it so,—on the contrary, it needs as much protection as the Lawton. In mild winters like that of 1873-4, they will go through unharmed; but if you wish to secure a full crop, you must give protection *every* year. The Lawton, when fully ripe, is a rich, luscious, melting berry,—I am almost ready to say the best of all berries. Of course this will surprise all those who have never eaten any but the poor sour things you find in market. It becomes black some time before fit to pick for market, and requires experience and discrimination in gathering. A little observation will show you at what time they will bear marketing to a distance; they then should be fully black, but not the least *soft*.

The Kittatinny I consider a poor fruit, not worth raising, and this will also apply to the Early Wilson.

The soil best suited for growing Blackberries is a moderately rich one,—if too rich the canes will grow rank and are liable to break in laying down.

For field culture, plant six feet apart each way, but in the garden, four feet will do. When the new canes are four feet high pinch out the terminal buds, and when the laterals are from twelve to sixteen inches long they should be stopped. From three to four canes in a hill is quite enough.

Late in the fall, but before the ground is much frozen, the old canes should be cut out near the ground. With the assistance of two hands I can easily lay down an acre a day. From three to four inches of soil is a sufficient covering, and I have not found it necessary to fully cover the canes below the branches.

In the spring, before they start to grow, they should be taken up. For this purpose I have found a potato hook the best. Good clean culture throughout the summer is all important, particularly in a dry season.

STRAWBERRIES.

The first fruit of the season is that gem of fruits, the fragrant, luscious, appetizing strawberry, ever suggestive of refined and delicate gastronomical enjoyment. Every person who holds in fee simple an acre of ground, is in duty bound to furnish abundantly for his family this delicious luxury so every way desirable and health-giving, and so easily obtained and easily cultivated.

A large majority of the farmers seem to think that there is a great mystery about the cultivation of the strawberry,—a mystery they have no time to solve, or cannot solve, and therefore many, very many, do not even make the attempt.

THE WILSON.

A few of the more delicate and choice varieties require a moderately clayey soil to grow them to the greatest perfection; but the Wilson (the berry for the million) will do well in almost any rich soil; but, if you want to grow extra large berries and an extra large crop, you must be liberal in the use of fine old manure and a moderate quantity of leached ashes.

FOR FIELD CULTURE

I plant as early in the spring as the ground will admit, in rows three feet apart, and set the plants just as deep as they stood before, and no deeper, from

twelve to fourteen inches apart in the rows. I use none but young plants of the last year's growth, and shorten the roots about one-third, as it facilitates planting and causes them to throw out a great many small roots. As soon as the flower stems appear they should be removed, so that the plants may not be weakened by bearing fruit. In a favorable season this may not be strictly necessary, but if neglected in a dry summer many plants will die from exhaustion. The runners should also be removed if you look for a good crop the next season. Clean culture and stirring the ground often are of the utmost importance, and most of this work can be done with the horse and cultivator.

MULCHING.

As soon as the ground is frozen sufficiently to bear a team, a mulching of long manure or marsh hay should be applied over the whole surface; but the plants should not be covered over two inches deep: more than that would tend to smother them.

AMATEUR VARIETIES.

I said that the Wilson was the berry for the million: it will endure more neglect than any other variety I am acquainted with, and will yield a greater amount of fruit on a given space of ground. But just so long as the standard of the public taste requires nothing better, it is perfectly useless to grow for market such varieties as Jucunda (Knox's 700), President Wilder, or Triomphe De Gand. The amateur may, however, indulge in these splendid varieties, for what they lack in productiveness they more than make up in color and quality, and that rich strawberry flavor so agreeable to all, without the acidity of the Wilson.

PLUMS AND PLUM CULTURE IN MICHIGAN.

BY T. T. LYON,—READ AT THE DECEMBER MEETING OF THE STATE
POMOLOGICAL SOCIETY, AT IONIA.

NATIVITY OF THE PLUM.

The real source from which have sprung the improved varieties of the plum as cultivated among us to-day, seems to be one of the uncertainties of the obscure past. Even its botanical cognomen (*Prunus Domestica*), would seem to indicate that, prior to its scientific recognition, it had been subjected to the modifying influences of artificial culture, so far as to have yielded to the seductive arts, by means of which, in so many cases, man has been able to win the means of subsistence, and even of luxury from the untamed elements with which the prodigal hand of nature has so profusely surrounded him. It is true that this species of the plum is supposed to have originated in southern or western Europe, and is often to be met with, in at least a semi-wild state, in the forests of those countries; but it seems to be by no means certain whether these are to be considered as the wild type, from which the improved varieties have sprung, or the degenerated offspring of cultivated sorts.

It is, however, by many, supposed that the native country of the original type of our cultivated plum is Syria; and that it found its way to Europe by importation, at a comparatively early period in the history of the human race; so early, indeed, that the evidence of its migration are lost among the myths of the classical or dark ages.

Indeed, so greatly do these improved sorts differ among themselves, either in wood or fruit or both, that it does not seem to be quite susceptible of determination that some of these sorts may or may not be referable to the Bullace (*Prunus Insititia*), or to the sloe (*Prunus Spinosa*), while some varieties, certainly, so far as the fruit is concerned, manifest a very supposable relationship with the American cherry plum (*Prunus Cerasifera*), or, at least, with the Chickasaw (*Prunus Chicasa*), or the wild red or yellow plum (*Prunus Americana*).

AT HOME IN OUR CLIMATE.

Whatever may be the fact in the case, although a very few of our improved varieties, and, among them that standard of high quality the Reine Claude, or Green Gage, are of European origin, this fruit seems never before to have

assumed so decided a prominence, relatively speaking, as it has done since, upon our virgin soils, it has blossomed forth into the noble and luscious varieties which American pomology has given to the world.

Although this fruit comes to us as an importation from the old world, its already lengthened trial, under all the varying circumstances of our fitful climate, with the additional difficulties of widely varied soil and aspect, has long since demonstrated that, with the possible exception of the apple, no one of the many European pomological contributions to our country, has been found more perfectly adapted to the exigencies of the case, so far as the mere question of hardiness is concerned. In fact, the tree is seldom, if ever, found to suffer from the severities of our climate, unless previously weakened by disease or the over-production of fruit; while, unlike the peach, its fruit buds are rarely winter-killed, from undue autumn development or other cause.

BLACK KNOT.

The plum tree, in our country, is liable to but few diseases; and but one of these, the Black Knot, has, so far, proved to be of a serious character. The investigation of this disease, from the very nature of the case, is beset with difficulties, and, as a consequence, theories have been, and still are, numerous.

Among the many observers of this malady, during its earlier history, were several gentlemen of Western New York, who became persuaded that they had discovered its cause in the operations of an insect which punctured the shoots and deposited its eggs in the wound. These observers claimed also to have discovered that, with its eggs, the insect in question, at the same time, deposited a poisonous substance which, acting upon the flowing sap, at and near the punctured spot, produced the diseased growth in question, the same becoming developed upon the surface on or about the third year after the occurrence of the puncture. The remedy devised to meet the demands of this theory was the careful removal of the punctures by excision and the application of a disinfecting wash to the wounds, for the purpose of neutralizing any possible remains of the infection. Specimens of the insect and also of the punctured shoots were sent to B. P. Johnson, of Albany, New York, and were by him submitted to Professor T. W. Harris, of Massachusetts; who, without expressing an opinion upon the cause of the malady, or the agency of the insect in producing it, identified the alleged culprit as a "leaf hopper," known in scientific parlance as "*Membracis Bubalus*."

Other observers seem to have reached the conclusion that the curculio, at the season for depositing its eggs, failing to find a supply of fruits, resorts to the young shoots for that purpose, and in so doing, so far poisons the circulation as to occasion the unsightly and injurious excrescences complained of.

Another class of observers have advanced the idea (of course without a possibility of demonstration), that this abnormal growth is a mere "vegetable ulcer;" but they do not even attempt to assign it to a specific cause.

William H. Read of Port Dalhousie, C. W., in *The Horticulturist* for May, 1855, claims to have given the subject many years of close and careful observation, and advances the theory that the disease is the result of the decay of the fruit, in contact with the branch, during the warm weather of August and September.

Each of these theories, when propounded, seems to have secured more or less advocates, but no one of them has succeeded in more than partially and, we may add, temporarily establishing itself in the confidence of those whose opinions on the subject may be entitled to respect.

FUNGOID THEORY.

In the American Journal of Horticulture for April, 1867, may be found a very scientific and carefully prepared article, contributed to that periodical by Charles J. Sprague, a horticultural observer of considerable note, in which he assumes, with a good degree of plausibility, that the excrescence in question is a fungus, known to naturalists under the specific name of "*Sphaeria Morbosa*." We quote the article somewhat at length as follows:

"The *Sphaeria Morbosa* is a fungus, belonging to a very extensive group, which infests the bark of trees and shrubs. The different species are found in myriads throughout the whole vegetable kingdom; sometimes preying upon living tissues, more frequently parasitic, upon decaying matter. They vary in their mode of attack, or rather they occur in different parts of the plants which support them. Some are superficial upon the bark; some are immersed in the subcuticular layer, bursting through the cuticle, erumpent as they are termed; others take possession of the inner bark, and so affect it as to occasion an unnatural and excessive development; a corky, irregular, watery growth, which finally bursts the outer cuticle, and covers the infested branches with unsightly excrescences. To this latter group belongs the *Sphaeria Morbosa*. The fleshy growth which it induces in the plum tree, or at least that portion which is immediately occupied by it, is called its *stroma*. This is, at first, a homogeneous mass, presenting no definite character. By and by it takes on a reddish coloration, which finally deepens into black; the surface becomes carbonaceous in texture, and is studded all over with minute papillæ. A section of the *stroma* will then exhibit a woody center with a carbonaceous rind. In this rind are innumerable little rounded cavities, the upper walls of which constitute the before mentioned papillæ; these are pierced by a minute hole, through which the spores, or germinating processes, escape, the whole cavity and its walls being called a *perithecium*. The spores are infinitesimally minute, oblong bodies, contained, generally eight in number, in diaphanous sacs, or envelopes, called *asci*, which develop from the ends of filaments, which line, in a dense mass, the whole bottom and sides of the cavities. These are not carbonaceous like the walls, but are of a gelatinous consistency. Imagine an egg-shell, from the inner walls of which grow a dense mass of soft bristles half an inch long, on the ends of which are little whitish, sausage-shaped sacs, containing oval bodies lying diagonally in the sacs, one applied to the other, sidewise, the bodies being variously lined, and you have a tolerable idea of the immensely magnified perithecium, with its filaments, asci, and spores.

"That this structure we have just described should be a plant; that this hard, black, charcoal-like substance should be vegetable, will seem strange to those unfamiliar with the study of similar growths; but it is vegetable, and has so permanent a character as to constitute a species. It must be allowed, however, that it is a matter of doubt, in mycology, how far the same fungus may be affected by the plants upon which it fastens, so as to change its habits and appearance. The older mycologists named the host of parasitic fungi after the plants upon which they were found; taking it for granted that they were all distinct species, if they had a different look. Schweinitz, the great pioneer of the study in this country, has enumerated a vast quantity of them in this way; but, since later observations have proved that many fungi take on different growths under varying circumstances, it has become a matter of considerable question how far the autonomy of these obscure vegetable growths can be established.

"The group to which this particular fungus belongs is, however, tolerably constant in character. The genus *Sphaeria* is well defined, if we include the newer genera, made out of the old genus by later writers, more for the convenience of treating of so vast a number of species, it seems to us, than on account of difference worthy of generic distinction. These carbonaceous, papillate fungi are so well defined in their peculiarities as to be readily identified by those familiar with their forms. Yet even these vary; and, when closely proximate forms are found on different plants, a question arises whether they are identical or not. The growths of the wild cherry (*Cerasus Serotina*) are often covered with a fungus very similar to the *Sphaeria Morbosa*. Indeed, almost any woodland border will furnish plenty of specimens. The perithecia are smaller and are sometimes prolonged into a short beak. The cherry belongs to the same order as the plum; and it may be that this parasitic fungus infests both, but is swayed by influences in both plants so as to develop differently. We have seen branches of the cultivated cherry similarly affected. The size of the spores is considered a good specific character, and yet these vary.

"It has been thought by some that the peculiar growth of the bark which bears this fungus is occasioned by the sting of a curculio; but any one familiar with the stroma of fungi will understand that this growth is characteristic of a whole family, and arises, not from insect poisoning, but from fungoid influence. The insects seduced by its soft, pulpy character in its early stages, may deposit there their eggs, and it is not unlike the flesh of unripe fruit in texture, at one period. Various methods have been devised to stay the ravages of this fungus. Sulphur placed in holes made in the trunk of the tree, has been resorted to; but we imagine that there are no sure preventives. When we remember the excessively minute size of the spores, we can understand that they may be absorbed with the nutriment of the tree, or taken into the stomata of the leaves, and carried into the tissues. Fungi infest wild plants as commonly as cultivated ones,—a proof that their occurrence is not necessarily due to an unnatural or deteriorated state of the plant they attack."

In taking leave of this abstruse and difficult subject, we may indulge the remark that, although the article just quoted gives abundant evidence of the thorough acquaintance of the writer with his subject, and notwithstanding the evidence he so clearly deduces to establish his case, it is a recognized scientific fact that fungi usually attack only diseased or decaying vegetation; and, as is notoriously the case with the fungus attendant upon pear blight, the most careful observation is liable to be at fault in any attempt to determine whether this fungoid growth is to be taken as the cause or the effect. In view of these considerations, it seems at least possible to entertain a doubt whether the fungus attacking the plum tree really either precedes, occasions, or constitutes the malady in question, or whether, on the other hand, it merely finds, in the already existing but undeveloped disease, the proper conditions for the development of its growth.

We may also further remark that all the theories of this disease seem to coincide in the promulgation of essentially the same remedy—that of cutting away all diseased growth—to which some add the application to the wound of a disinfectant, calculated to effectually neutralize any possible remaining diseased matter.

RED SPIDER.

Some years since, in at least a portion of this State, the plum tree, for several years, suffered from the premature ripening and dropping of the foliage. This

generally occurred when the fruit was about one-half or two-thirds grown ; leaving the trees not only shorn of the ability to perfect their fruit, but at the same time unable to ripen the wood growth already in progress. In such cases there generally remained to the tree only sufficient vigor to enable it to push forth a few feeble leaves from near the termini of the shoots, and such trees, consequently, were overtaken by the subsequent winter in a feeble and unripened condition, totally unfitting them to withstand its rigors. Trees, when severely affected, were frequently killed outright by the succeeding winter, seldom surviving the second.

The cause of this apparent disease (which seems to have been of only a few years duration), seems, at the time, to have eluded observation. At least, we do not recollect to have noticed even an attempt to suggest either the cause, or a remedy. Subsequent inquiry and research, however, have pretty well satisfied us that it is to be attributed to the depredations of a noted but infinitesimal pest of our greenhouse and parlor plants, which, during the hot, dry weather of late summer, doubtless found the out-of-door climate, and the foliage of the plum tree, favorable for his operations. The cultivators of exotics will, doubtless, at once understand that we allude to the Red Spider. This being the cause, the remedy lies in the repeated syringing of the foliage (especially its under side), with weak soap-suds, soot water, or even clear warm water, as soon as the enemy shall be discovered, and continuing the process frequently till he is effectually dislodged.

THE CURCULIO.

The only other insect enemy of either the plum tree or its fruit, whose depredations have proved at all formidable, is that most persistent and troublesome of all the enemies of the fruit grower, the Curculio. It is generally said and believed that insects are guided in their operations purely by instinct, education being assumed to have no place in their system of tactics ; and yet we find the "Little Turk," who must have spent long ages upon this mundane sphere before he made the acquaintance of the "*Prunus Domestica*," all at once turning his attention to this fruit, and adhering to it, judging from the persistency of his operations, with a pertinacity almost or quite without a parallel, excepting, possibly, the more modern and equally notable case of the beetle, so recently colonized upon us from the deserts of Colorado.

The idea is advanced by some entomologists, that when, from the clearing away of the native growths, or other similar cause, an insect finds itself deprived of the customary supply of food for its support, or that of its progeny, it turns to some other and not unfrequently to a cultivated family or variety of plants or fruit as a substitute ; and we see much ground for the supposition that the comparatively recent devotion of the curculio to the domestic plum is to be accounted for in this manner. Our interest in the matter, however, lies not so much in determining why the attack is made, as in devising an easy and certain preventive,—the attempt to do which seems, so far, to have resulted in but doubtful or partial success.

CURCULIO REMEDIES.

It has been frequently remarked, and apparently with more or less correctness, that entomologists, heretofore, seem to have been more intent upon a correct scientific description of the insects that may have come under their observation, than upon such acquaintance with their habits, including the times, places, and modes of taking food, depositing their eggs, and undergoing their

transformations, as might be necessary to enable them to determine with certainty when, where, and how to best enter upon a defensive warfare against them. In confirmation of this assumption, we may remark that however much the savants of this science may have learned of the habits and preferences of the curculio, they have as yet failed to inform those outside their charmed circle upon what this insect subsists in the perfect or winged state, or, indeed, whether or not he partakes of food at all in that state; it being understood that the fruit is punctured, not to obtain food, but rather to place its progeny in immediate connection with food adapted to its growth and development. If the history of the likes and dislikes of this insect, and of all the peculiar circumstances of his existence, during his several transformations, could be accurately determined, there is, to our mind, scarcely a doubt that such knowledge would supply to us the ready means of organizing a deadly campaign against him, possibly at more than one period of his existence. As it is, however, the lovers of the plum have been by no means idle in this warfare. While some experimenters have attempted to drive him away with offensive odors, others have proposed to attract him by dazzling his eyes or tickling his palate (supposing him to have such), and luring him to his destruction. Yet others have imagined this insect endowed with a degree of foresight such as would preclude the female from depositing her eggs in positions from which the forthcoming larvæ would be unable to reach the earth for transformation. Hence the paving of the surface beneath the trees, and the planting of the trees inclined over water. Others again have attempted to drown the enemy by periodically flooding the ground in which the trees are standing; and yet others would repel his attacks by syringing the trees and fruit with milk of lime; and anon others would do so by plugging the trees with sulphur, to be taken up and transmitted through the circulation, thus rendering the entire tree offensive to the enemy.

Some twenty years since, the Matthew's remedy was claimed to have proved a specific, and it was alleged that a single yearly application would suffice. Its discoverer, refusing to divulge his secret to the public, referred it, for experiment, to three of the most noted horticulturists of our country; but their experiments do not seem to have warranted them in endorsing it, and the secret seems to have been buried in the grave of the discoverer.

Some three or four years since, Mr. Windoes of Kalamazoo, in this state, accidentally discovered that some of his plum trees, which had been subjected to the dense smoke of burning coal tar, were not visited by the curculio, while those adjacent, and not so treated, lost their crop as usual. Taking the cue from this fact, he, for some three years in succession, repeated the process, adding a little sulphur to the coal tar and burning the mixture in an iron vessel under the trees. By the offer of the material gratis, a neighbor was also induced to make the trial upon his own trees, which resulted also in the saving of his crop of plums. Three years of success with this remedy has given Mr. W. so much confidence in its effectiveness that he, during the past year, has made it public, and quite a number of persons made trial of it upon their last summer's plum crop; but we regret to say, so far as we have yet learned, with but indifferent success. As there can be no doubt of the actual and repeated success of Mr. W., we can only account for these failures upon the supposition that a different quality of coal tar was used, or, otherwise, that there may have been a lack of thoroughness in the application of the remedy. Possibly, also, the enemy may in these cases have had no choice of pasture.

One of the oldest remedies, and the one that to-day, doubtless, commands a greater degree of confidence than any, if not all others, is that known as the "jarring process," consisting of the jarring down of the insects upon a cloth spread out for that purpose, and the gathering up of the insects, together with the punctured and fallen fruit, and destroying them. Indeed, this may with propriety be said to be the only remedy that, when thoroughly and efficiently applied, is sure to be always successful. To succeed with this, however, it must be repeated one, two, or even three times a day (according to the state of the weather and the numbers and persistence of the enemy), and must be commenced as soon as the fruits shall have swelled sufficiently to burst the remains of the calyx enclosing them, and thus become exposed to the attack of the enemy, and continued till his final disappearance, which will probably not be until the fruit is nearly of full size. Merely shaking the tree will not suffice. The insect will only yield, with certainty, to a sudden jar, such as would be given by a blow upon the trunk or the stump of a shoot, with a hammer or mallet. Such implement should always be carefully padded if intended to be used directly upon the bark of the tree, to avoid injury from bruising.

Some years since the horticultural public were elated with the announcement that Mr. Ransom, of St. Joseph, in this State, had discovered a means of trapping the curculio, by smoothing and compacting the earth about the base of the tree, and placing there chips or other similar articles, under which the insect would take shelter, at night, and could be taken up in the early morning and destroyed; but alas! it was also soon discovered that the "Little Turk" refused to accept these seductive but treacherous temptations, as soon as the warmth of the advancing season sufficed to enable him to bear the night temperature. Still, while these traps are effective, they greatly economize labor, and it is understood that some of the best practitioners employ them in connection with the jarring process.

DR. HULL'S EXPERIMENTS.

We close the consideration of the modes of contesting the ground with the curculio, with an extract from the *Horticulturist* for November, 1874, at page 337; which gives some accounts of the experiments of Dr. Hull of Alton, Illinois, stating that, from 1,930 trees, he, this year, captured not less than 153,000 curculios. In a statement before the Alton Horticultural Society, the doctor says:

"Early in the season I commenced a series of experiments to determine, if possible, at what particular period of the day curculios were at rest. On three different days I dropped a number of curculios in flour, and near sundown of each day put them in the forks of the trees and watched them until they crawled into some place of concealment, which was usually in the crevices of the rough bark, and into depressed parts made by cutting off limbs of trees. Out of 30 insects thus watched to places of rest all concealed themselves as stated, except one, which went to the ground and crawled under a clod of earth. Out of 30 insects thus watched, all but one were found early the following morning just where they went to rest at night.

"Again, I made other tests with marked insects by placing them on the trees in the morning. This experiment was repeated on three successive days, employing 30 insects each day. Near sunset the trees were thoroughly jarred over a curculio-catcher. This experiment resulted in the capture of 27 of the

90 insects on the trees on which they were put, and at different times since, in other parts of the orchard, 49 of these marked insects have been jarred down, leaving 16 yet at large.

From these tests I infer that curculios, as a rule, rest at night and fly freely by day. They make clear what every practical man when jarring trees must have observed, viz: that these insects fall near the center of the catcher, because places of concealment are most numerous near the trunks of the trees, and for this reason, also, a small curculio-catcher is nearly as good as a large one, provided the trees are jarred during the colder parts of the day."

THE ROT.

The fruit of the plum, when nearing maturity, is occasionally subject to a malady commonly known as the "rot." This disease (if such it can be called) usually first appears at the point of contact between two fruits as they hang together on the branch; or where a fruit hangs in contact with the branch, or, sometimes, where an injury or rupture of the skin has occurred; but rarely if ever upon the smooth and exposed surface of a fruit. This malady, as in the case of "black knot," seems to spring from some cause so obscure or intangible as to have, so far, eluded discovery, or at least a clear identification. It is variously attributed to atmospheric causes, or the influence of dew, rain or moisture from any source, retained at the point of contact. By some it is attributed to the attacks of fungus. All these assumptions are, however, to be received as, at the best, but shrewd guesses. We may, notwithstanding these uncertainties, very reasonably suspect that among them lies concealed the real cause. The skin of the plum is of a smooth and delicate texture, and any cause, atmospheric or otherwise, operating to produce a crack or rupture of the skin, during the usually warm weather of August or early September, would very certainly superinduce rapid decay of the maturing tissues of the fruit. Indeed this decay, when once commenced, seems often to be almost sporadic in the rapidity with which it propagates itself upon the fruit. That such rapid spread of the malady is to be attributed to fungoid influences may doubtless be considered as highly probable, if not indeed quite certain.

HOW TO SUCCEED.

In the early days of the settlement of Michigan, the culture of the plum was nearly as general, though by no means as extensive, as that of the apple; and though this fruit was probably less commonly grown than the peach, it is doubtless quite within the truth to say that it was fully as common in our gardens as the cherry, and even more common than the pear. That its cultivation is now so generally abandoned, notwithstanding its eminent popularity and general desirableness as a fruit, is, we apprehend, chargeable not in any considerable degree to any especial failure or lack of the tree, nor yet to any serious difficulties in its culture or management, but almost entirely to the well-nigh universal appropriation of the fruit by the curculio, an enemy so nearly infinitesimal in size, and so insidious in his attacks, that we feel warranted in supposing that even a majority of those who, for a lifetime, have almost annually been robbed of the product of their trees, have never seen or identified the robber, if indeed they are not in many cases actually unaware of his presence.

With those possessed of only the space for a very few trees of this fruit, or who, for any reason, are not disposed to plant somewhat extensively, or who, having planted more or less, are, for any reason, not resolutely determined to

wage a war of extermination against the curculio, to refrain altogether from planting this fruit is doubtless the dictate of wisdom, inasmuch as such will almost certainly see the fruit, if planted, fall a prey to the enemy, while at the same time they must have the unpleasant consciousness that they are become the breeders of insects for the annoyance and injury of their less easy-going neighbors. We would by no means be understood to discourage the planting of the plum, even in the smallest gardens; but rather as urging that such planters should well consider, before planting, whether they have the requisite love of such pursuits, and the pluck necessary to carry them through the conflict.

To the large planter, the whole subject appears in a widely different aspect. One of the noticeable uncertainties in almost any business pursuit lies in its liability to be overdone. In plum culture, with the obstacles to be overcome, requiring, to override them, an intelligent acquaintance with the whole subject, together with great thoroughness in execution, comparatively few will venture, and probably even fewer will succeed, although success is fully within the reach of all. These circumstances constitute the best possible assurance against the liability to overdo this branch of fruit culture.

PROFITABLENESS.

A plantation of considerable extent will fully warrant the making of thorough arrangements for the care and management of the same, as well as the providing of all requisite facilities for the warfare upon the curculio, in the most efficient manner; while, in such cases, the actual expenditure for these purposes will be found to be very small when compared with the value of even a very moderate crop. With a plantation of one hundred trees, in bearing, two men would apply the "jarring process," (or that and the "Ransom Trap," jointly,) to the whole in about one-and-a-half hours; and if this were required to be repeated three times each day, the whole would require but the equivalent of one man's time. This might be required for a period of six weeks at the most, although during very windy or rainy weather no application would be needed. The cost of apparatus with which to prosecute the warfare against the curculio need not exceed ten or twelve dollars, to which must be added the hire of a trusty man or boy for the above time. These two items will constitute nearly or quite the entire cost of management for the season, in excess of that required for a similar orchard of apples. As to the relative values of the products of each, when grown, we leave those interested to estimate for themselves; only remarking that so far as we have been conversant with results in such cases, those derived from the culture of the plum, even with curculio warfare against them, have been highly satisfactory.

SOIL.

The soil to be chosen for a plantation of plums should, by all means, be a strong loam, inclining to clay rather than sand; not only because such a soil best suits the plum, but also for the reason that it does not so well suit the curculio, who avoids heavy soils, but luxuriates in light, dry, warm ones.

ASPECT.

The aspect to be selected for a plantation of this fruit is a matter of less importance than in the case of the more tender fruits; still, we would object to a very decided southerly slope, and indeed, would prefer a slope in almost any other direction; and such slope would be all the more acceptable if but just

sufficient to ensure good drainage. Too positive an inclination to the sun, at mid-day, might to some extent create a predisposition to the "rot" of the fruit, as heretofore described.

PROPAGATION OF THE TREE.

In the nursery, the plum is sometimes propagated by grafting in the early spring upon seedlings, and occasionally by root-grafting; but the more common method is by budding upon seedling plums, in the nursery rows; and the trees are usually offered for sale at two and three years from the bud. A few varieties are found to grow well upon peach stocks; but such trees are hardly to be recommended, except for planting upon light soils, such as are not properly adapted to the plum on its own stock.

ORCHARD PLANTING.

In orchard planting sixteen and a half feet in the rows each way is a very good average distance for the trees, although in extensive plantations it may be found desirable, for the convenience of gathering the fruit, and to facilitate the reaching of all parts of the plantation with a team and conveyance, especially while the trees are laden with fruit, to leave, after every fourth or sixth row, an increased width of perhaps twenty or twenty-five feet, as well as one or more such wider spaces in the transverse direction. The distance of the trees apart, however, should be determined with more or less reference to the habits of growth of the varieties to be planted. Some sorts (and among them may be named the Frost Gage and the entire class of Damsons) are comparatively upright and dwarfish in their growth, and would, perhaps, on most soils, find sufficient room at even twelve feet apart. These might (as, indeed, for the convenience of gathering the fruit, should all other sorts), be placed in a block by themselves, and at a distance apart adapted to their habits of growth. The dwarfish growth of such as those before mentioned, results of course in a small and compact head, requiring little pruning beyond the thinning out of the weaker shoots, if the top shall become crowded, and possibly the occasional shortening of a leading one that may be overgrowing its fellows. Many of the finer varieties, however, have the habit of throwing out a few strong and lengthened shoots, with a few if any side growths, and hence of forming open and irregular heads, if left altogether to themselves; and in addition to this, these better sorts very generally manifest a decided tendency to overbear. As an effectual remedy for both these difficulties, we would recommend the practice, with varieties of such habit, of annually "shortening in" at least the leading shoots. If this practice shall be instituted, and continued while the tree is developing its head, not only will the exhaustion and possible disease of the tree, from overbearing, be in a great measure avoided, but it will at the same time be kept within such limits that the distance of one rod apart will afford it ample room even when fully grown.

LOW-BRANCHED TREES.

We are thoroughly in favor of low-branched trees, as a rule; and we would by no means make the plum an exception to such rule. Our recommendation, therefore, would be to branch the trees, not more than one foot above the ground, for the reasons, among others, that a low head is less exposed to injury from high winds, which occasionally, in exposed positions, will otherwise loosen the roots and incline, or sometimes even almost uproot the tree. The whole head is also more accessible for the gathering of the fruit and similar opera-

tions. There is, no doubt, some force to the objection that a low head is an obstacle to the employment of the "jarring process" and also of the "Ransom traps," in the war upon the curculio; but in case a conveniently devised apparatus is employed, this difficulty is believed not to be important, especially when compared with the advantages to be gained. Under no circumstances would we tolerate branches at more than two or three feet from the ground.

Having thus given some cursory hints upon the several points embraced in the general subject of plum culture, we turn to the consideration of the

LIST OF VARIETIES RECOMMENDED FOR GENERAL CULTIVATION IN THIS STATE BY THIS SOCIETY.

In selecting from the large number of varieties described in the books, it should by no means be inferred that the best have, in all cases, been chosen; and such inference would be the more improper for the reason that for many years past, indeed, almost since the advent of the curculio, few attempts have been made by our growers to introduce and test additional sorts, and hence a large number of really excellent varieties are nearly or quite untried in our State, so that the committee on lists of fruits could have found no warrant for recommending them. We refer to the varieties recommended, as nearly as practicable, in the order of their ripening.

PRINCE'S YELLOW GAGE

only appears in the family list, with the recommendation to plant at the rate of ten trees in one hundred.

This is the earliest variety on the list, and is among the very earliest of American contributions to our collections of this fruit. It originated as early as 1783, with one of our American pomologists—William Prince, of Flushing, Long Island. The vigorous, spreading tree is easily identified by those acquainted with its peculiar habits, and the medium sized, rich, sugary, and melting fruit is equally easy of identification. It is a freestone fruit, ripening early in August.

DUANE'S PURPLE

appears only in the market list, with the recommendation to plant twelve trees in one hundred.

This plum originated with Judge James Duane, Duanesburgh, N. Y., and was introduced to the public by William Prince, of Flushing, Long Island, as early as 1826, he having received it from the originator. By a mistake in the transmission of cuttings, it was for many years confused with the peach plum, a variety imported by Judge Duane from Europe. The tree is a strong grower, with very downy shoots. The fruit is quite large, oval, or oblong, reddish purple, with a few yellow specks and lilac bloom. Flesh, amber colored, juicy, moderately sweet, adhering partially to the stone. It ripens just before or with the Washington, from the beginning to the middle of August.

YELLOW EGG

is quoted in the market list only; to be planted at the rate of sixteen trees in one hundred.

This is commonly known in Europe as *White Magnum Bonum*. It is a very old variety, and there seems to be some doubt whether it is to be considered as a European or an American fruit. In fact it appears quite probable that there are in reality two varieties, the one European and the other American, but

differing so slightly that it is difficult, if not impossible to distinguish them in the fruit, although there may be a slight difference in the habit of the trees. It is a large, oval fruit, too coarse for the dessert, and chiefly valued for culinary purposes. A good bearer, but not very productive on light soils. The flesh adheres to the long and pointed stones. It ripens about the middle of August.

GREEN GAGE, OR REINE CLAUDE,

is included in the amateur list only, and the number recommended to be planted in a collection of one hundred trees is ten.

This variety occupies much the same position among plums as do the Seckel among pears, and the Delaware among grapes, it being generally conceded to have no superior, so far as quality is concerned. It is one of the oldest varieties of this fruit known to cultivators, and in France, to which country we are indebted for its earliest history, it is known as "Reine Claude," and it is alleged to have been introduced into that country by Queen Claude, wife of King Francis I., who lived in the early part of the sixteenth century. It received its English name from a family by the name of Gage, who, during the last century, obtained this variety, among others, among the monks of Chartreuse, near Paris, and introduced it into England, and having lost the name of this on the journey, it was re-christened with the name of its introducer. It has long held rank as the best plum in England, and, so far as quality is concerned, it must be admitted to have no superior in the United States. The tree is a slow grower, with stout, smooth shoots, and buds very much shouldered. The fruit is green, or yellowish green, and, when fully ripe, slightly dotted or marbled with red. It ripens about the middle of August. It has, in a few instances, very nearly reproduced itself from the seed; but none of its progeny seem to have proved quite equal to the original. Like nearly all our old and popular fruits, it is cumbered with numerous synonyms, of which Downing, in his late edition, quotes no less than thirty-eight, and these are by no means all that might be gathered up.

HULING'S SUPERB

appears in the amateur list only, with the recommendation to plant ten trees in an orchard of one hundred.

This variety originated in Pennsylvania, on the grounds of a gentleman named Keyser, about the year 1829, and hence came to be locally known as the Keyser Plum. It was, however, first brought prominently to the notice of the public by Dr. W. E. Huling, also of that State, and from him has received its acknowledged cognomen. The earliest published description of this fruit appeared in "Prince's Pomological Manual," in 1832; but, unfortunately, a spurious variety was at first disseminated under this name, and hence the true sort came very slowly to be known and appreciated. In the earlier editions of Downing's work on "Fruits," it was erroneously characterized as a free-stone, — a mistake that is corrected in later editions. The tree is exceedingly vigorous, with short, blunt, downy shoots, prominently shouldered buds, and large, broad, thick leaves. The fruit is very large, even larger than the Washington, roundish, oblong, tapering to each end, with a shallow suture extending half round; skin dull, yellowish green, with a pale bloom; flesh yellowish, fine, melting, juicy, vinous, rich, excellent, adhering to the stone. It ripens about the middle of August.

WASHINGTON,

known also as Bolmer, or Bolmer's Washington, appears in the market list with twenty trees of the proportion of one hundred, and in the family list with the proportion of twelve in one hundred.

This noble fruit originated, according to Downing, on what was known as the Delancy farm, on the east side of the Bowery, in the city of New York; but the tree was grafted, before bearing, with another variety, and hence escaped notice until Mr. Bolmer, a merchant in Chatham street, planted a sprout from it, which came into bearing about the year 1818, when the remarkable size and beauty of the fruit at once attracted universal attention. The young wood is light brown, downy, with remarkably large, broad, and glossy foliage. Fruit of the largest size, roundish oval, with an obscure suture. Skin, before fully ripe, dull yellow, faintly marbled with green, slightly blushed or dotted with pale crimson. Flesh, yellow, firm, very sweet and rich—a freestone. Ripe from the middle to the last of August.

LOMBARD

appears only in the market list, with the recommendation to plant twenty trees in one hundred.

This is one of the recent American varieties. It was produced from seed by Judge Pratt, of Whitesboro, N. Y., and was for some time known as Bleeker's Scarlet; but subsequently falling into the hands of a Mr. Lombard, of Springfield, Mass., it was by him brought to the notice of the Massachusetts Horticultural Society, which, as a compliment to Mr. Lombard, and no doubt in ignorance of its earlier christening, rebaptized it as Lombard. This being the first published description of the variety, under pomological authority, this latter name, by common consent, came to be recognized as the leading one.

The tree is unusually hardy and vigorous, with bright purple, glossy shoots, and with leaves curiously crimped. Fruit, medium, roundish oval, with an obscure suture. Skin, violet red, paler in the shade, with a thin bloom. Flesh, yellow, juicy, pleasant, not rich, adhering to the stone. Ripe the middle and last of August.

CANADA EGG

is recommended for planting in the market list, at the rate of twelve in one hundred; in the family list, ten in one hundred; and in the amateur list, ten in one hundred.

This plum is suspected to be an unrecognized old variety. It owes its reputation, and, indeed, its place in the Society's lists, chiefly to its success upon the grounds of the Messrs. Husted, of Lowell, Kent county, in this State, who are said to have found it on the grounds of a Mr. Lewis, near their nurseries in Lowell, he claiming to have obtained it from a nursery in Canada; hence the name Canada Egg,—used, as we are given to understand, only as a means of designating it pending its anticipated identification. The tree is understood not to be a strong grower, but very productive. Its pseudonym is partially a misnomer, as the fruit cannot properly be said to be ovate. Fruit of medium size, possibly a little larger than Lombard; a rich purple. Flesh, bright yellow, very juicy, and melting, parting from the stone. In season about with Lombard, the middle and last of August. The description is given from memory.

JEFFERSON

appears in the family list, recommended for planting at the rate of sixteen in one hundred; and in the amateur list at the rate of thirteen in one hundred.

We can give no better or more reliable notice of this plum than that of the late A. J. Downing, and we accordingly quote his remarks entire from the earliest edition of his "Fruit and Fruit Trees of America," published in 1846:

"If we were asked which we think the most desirable and beautiful of all the dessert plums, we should undoubtedly give the name of this new variety. When fully ripe, it is nearly—shall we not say *quite*—equal in flavor to the Green Gage, that unsurpassable standard of flavor. But when we contrast the small and rather insignificant appearance of the Green Gage with the unusual size and beauty of the Jefferson, we must admit that it takes the very first rank. As large as the Washington, it is more richly and deeply colored, being dark yellow, uniformly and handsomely marked, with a fine ruddy cheek. It is about ten days or a fortnight later than the Washington, ripening the last of August, when it has the rare quality of hanging long on the tree, gradually improving in flavor. It does not, like many sorts, appear liable to the attacks of wasps, which destroy so many of the light-colored plums as soon as they arrive at maturity.

"We received the Jefferson Plum a few years ago, from the late Judge Buel, by whom it was raised and named. The original tree is still, we believe, growing in his garden near Albany. It is a good and regular bearer, and the crop is very handsome upon the tree.

"Branches, slightly downy; leaves, oval, flat; fruit, large, oval, slightly narrowed on one side, toward the stalk; skin, golden yellow, with a beautiful purplish red cheek, and covered with a thin, white bloom; stalk an inch long, pretty stout, very slightly inserted; suture, indistinct; flesh, deep orange (like that of an apricot), parts freely, and almost entirely from the stone, which is long and pointed; very rich, juicy, luscious, and high-flavored; hangs a fortnight on the tree."

COLUMBIA

is recommended only for the amateur list, and to be planted at the rate of eight in one hundred.

This plum originated from seed of the Green Gage, by L. U. Lawrence, of Hudson, N. Y., and seems to have attracted less attention than its very large size and fine appearance would warrant, partially, no doubt, because from the first it gained the unfavorable reputation of being more than usually subject to the rot of the fruit. The tree is vigorous and productive; fruit very large, nearly globular, with one-half rather larger than the other; skin, dark or brownish purple, with frequent light specks, and a dense blue bloom, but partially hiding a reddish tint, on the shaded side; flesh orange, moderately juicy, but at maturity rich, sugary and excellent. It is nearly a freestone. Ripens at the end of August.

MC LAUGHLIN

appears only in the amateur list, with the proportion of thirteen in one hundred.

This fine plum originated at Bangor, Maine, with James McLaughlin, having first fruited about the year 1842 or 1843, and was introduced to the public in the year 1846, by means of an article published in the first volume of the Horticulturist, by B. F. Morse, of that place, it having been exhibited at the

weekly shows of the Massachusetts Horticultural Society the same season. The editor of the *Horticulturist* (the late A. J. Downing) says of it: "The McLaughlin we consider a very excellent fruit, perhaps of the first rank. It is not unlike, in form, to the Purple Gage, and has a high flavor." We also quote the description of Mr. Nourse:

"The tree is of rapid growth, making stout, vigorous shoots of four to six feet in a season. The top is round, low, spreading, and, as its grower says, it makes a regular apple tree top. Leaves long, broad, and glossy; bark smooth and clean, and on the new shoots, dark; fruit above medium, nearly round but flattened at either end, being of greater breadth than length; suture obscure; stalk about three-fourths of an inch long, inserted in a small cavity; skin thin and tender, russet yellow, sprinkled with a red tinge, which deepens to a purplish hue around the stalk, where there is considerable bloom; flesh dull yellow, juicy, rather firm, very sweet, and of luscious flavor, surpassing all varieties that have yet fruited here. Ripens the last of August."

IMPERIAL GAGE.

is recommended for planting in the family orchard, at the rate of fifteen in one hundred; and also by amateurs, in the proportion of ten in one hundred.

The history and description of this superior fruit is so graphically given in Downing's "Fruits and Fruit Trees," that we indulge in another verbatim quotation. After giving some eight or ten synonyms of this variety, he characterizes it as follows: "The Imperial Gage has long enjoyed the reputation of one of the most excellent and productive of plums. It was raised at Prince's Nursery, Flushing, New York, from the seed of the Green Gage, and the fact of the fruit of a single tree, near Boston, having produced fruit to the value of nearly fifty dollars annually, has often been repeated as a proof of the profit of its cultivation for market. The tree grows freely and rises rapidly, and has long dark shoots, slightly downy. Fruit rather above medium size, oval, with a distinct suture. Stalk nearly an inch long, slightly hairy and pretty stout, inserted in an even hollow. Skin pale green, until fully ripe, when it is tinged with yellow, showing a *peculiar marbling of dull green stripes*, and covered with copious white bloom. Flesh greenish, very juicy, melting and rich, with a very agreeable flavor. It separates freely from the stone. The latter is oval, and pointed at both ends. Best. Early September."

SHELDON

is recommended only as a market fruit, and at the rate of only eight in one hundred.

We extract the following from the work previously quoted: "Originated on the farm of Wareham Sheldon, Huron, Wayne county, New York. Tree a rapid grower, and very productive. Branches smooth, stout. Fruit large, oval; suture shallow. Skin deep purple, with a thick blue bloom. Stalk short, in a small cavity. Flesh greenish, juicy, slightly acid; separates from the stone. Good. September."

COE'S GOLDEN DROP

appears in each of the society's lists, being proposed in that for market purposes at the rate of twenty in one hundred; in the family list at fourteen in one hundred, and in that for amateurs in the ratio of thirteen in one hundred.

This plum is an English contribution to our collections of fruits, having been produced by Mr. Coe, a gardener near London, who raised it from the

seed of a Green Gage, impregnated with the pollen of the Egg Plum. Mr. Downing says, in his description of this fruit ("Fruits and Fruit Trees," page 904): "Requires a warm late season to ripen it, north of 41° of latitude." This remark cannot be held applicable to Southern or Western Michigan, since (doubtless on account of our insular position) we are enabled to grow, with a good degree of success, many of the products of a considerably more southern latitude; besides which, actual results have already demonstrated that, so far as these regions are concerned, there has been, so far, no serious difficulty in ripening this plum certainly and satisfactorily.

The tree is moderately vigorous; branches smooth, and it proves at least sufficiently productive. Downing describes the fruit as follows: "Fruit of the largest size, oval (we would say ovate), with a well marked suture, on one side of which it is a little more swollen than on the other, the outline narrowing to the stalk. Skin light yellow, with a number of rich, dark-red spots on the sunny side. Stalk nearly an inch long, rather stiff, set on the end of the fruit. Flesh yellow, rather firm, adhering closely to the stone, which is quite pointed. Flavor rich, sweet and delicious. Very good. Last of September."

BAVAY'S GREEN GAGE, OR REINE CLAUDE DE BAVAY,

is recommended by the society, to be planted as a portion of the family orchard, in the ratio of fifteen in one hundred, and also by amateurs at the rate of thirteen in the hundred; and we may indulge in the remark that, to our apprehensions, it is about an even question whether it would not be preferable to add it also to the market list, or even to substitute it for Coe's Golden Drop, on that list. We have followed Downing, in designating the seasons of the ripening of varieties, and he gives the season of this as a little later than that of Coe's Golden Drop; but our personal experience with the two, in the same plat, and running through a number of seasons, would show little difference between them, and if any, that the Bavay is possibly a little earlier than the other. We fruited it from some of the first scions distributed after its importation into America.

We quote the following, from a letter to the Horticulturist, in April, 1847, by S. B. Parsons of Flushing, Long Island:

"When in Brussels, some two years since, I visited the nursery of Bavay, at Vilvorde, near that city. Among several new fruits, I found the new plum *Reine Claude de Bavay*, of which he kindly presented me with a colored engraving. This plum was produced from the seed of the old Reine Claude, by a Belgian gentleman named Esperin; and I translate from the *Revue Horticole* the following description, which is much more detailed than any I could possibly give from recollection:

"This plum is more uniform than round; it is longitudinally marked by little violet colored veins, on a yellowish ground, sometimes accompanied by little spots of the same color, and covered with a waxlike and scarcely apparent bloom. Its flesh adheres slightly to the stone. The habit of the tree is similar to that of old Reine Claude (*Green Gage*), the wood is a little grayish, the branches are vigorous and the leaves are large and a beautiful green color. This plum, although very good, is not equal to the old Reine Claude; but its chief value is the season of its maturity. This last year, notwithstanding the great heat we have experienced, it did not ripen till the 29th of September,—a time when no fruit of the old Reine Claude can be found remaining."

It will be borne in mind that this is a European description, given in advance of

its fruiting in this country. It will, even as far north as Southern Michigan, ripen somewhat in advance of the season named, and will at least sustain the character above given, if indeed it does not somewhat improve in quality, under the influence of our warm sun and bright summers. Indeed, our own experience with it, in the same plat and exposure with the Reine Claude, has impressed me with the conviction that, with us, it is very nearly its equal, even in quality; while, in several other respects, it is decidedly the superior of that old and representative variety.

INTELLIGENT LABOR INSURES SUCCESS.

Having thus gone through the list of varieties recommended for general cultivation, we, in taking leave of the subject, would remark that fruit culture, like every other pursuit of an agricultural character, offers no royal road to success. To the truth of this remark, plum culture is certainly not an exception. Nor yet, on the other hand, does it present any unusual or insuperable difficulties. The curculio and the black knot, with this fruit, are not more serious obstacles, if we take into consideration the means of efficient prevention, than are the codling moth, the borer, and the blight, which so seriously interfere with our success with the apple and the pear. True, if utterly neglected for a few years, the curculio is certain to utterly annihilate the crop of plums; while, under these circumstances, the black knot will, with almost equal certainty ruin the trees. But, on the other hand, the codling moth, with years of neglect, at length appropriates, as he is already doing in the older portions of the State, almost the entire crop of apples, at least in a season of sparse bearing, while neglected or stunted trees are pretty certain to fall a prey to the borer, and even vigorous trees are liable to be summarily devoted to the blight. It must also not be forgotten that, in the present state of our knowledge of these insects, we can, after years of neglect of the plum, at any time, take up the warfare against the curculio, and, by sturdy persistence, rescue a crop from the destroyer; while, on the other hand, the increase of the codling moth, consequent upon continued neglect, can be subdued, if at all, only by years of persevering effort, in the application of the known and recognized remedies, while the probabilities are that, with this latter enemy, the most thorough warfare will result in but partial success; or, at the best, that complete success must be dependent upon the ability to command intelligent and efficient co-operation throughout a very considerable range of territory, and for a considerable term of years.

The time seems, however, to have already passed by, when intelligent fruit growers expect to reach the goal of success, by sleeping on their oars; and, as it is such only that we are presumed to be addressing, we close by saying: Study carefully the tree, the fruit, the soils and modes of culture and management, together with the insects and other enemies of the plum; and, in so doing, you will be sure to gather, not only a love of the subject, but also a confidence, begotten of knowledge, that, in this as readily, at least, as in other branches of fruit culture, is to be found a broad and practicable road to success,—a success all the more certain and laudable for the reason that the path is sure not to be beaten by the feet of the motley crowd who lack the courage to diverge from the track beaten by the multitude, or to undertake the race for success in the face of positive difficulties.

NEW VARIETIES OF FRUITS.

READ BY T. T. LYON OF SOUTH HAVEN, AT THE LANSING MEETING OF
THE STATE POMOLOGICAL SOCIETY.

APPLES.

GENTLEMEN: Having been requested to prepare some account of the new varieties of fruits now being brought before the public, we find ourselves embarrassed from the mere amount of material at hand, and also at a loss to determine where to draw the line between the old and the new. It will, of course, be understood that many of these candidates for the favor of planters have not fruited, to any considerable extent, if at all, out of their original localities; and hence that what we may say of them must be said largely upon the representations of their originators, or other partial and possibly over-enthusiastic friends.

Inasmuch as the apple stands first in alphabetical order, as well as first in real value and importance to the people of the State, your attention is first drawn to that fruit.

SHIAWASSEE BEAUTY.

This can hardly be called a new variety, except in a very accommodated sense; and attention is now called to it for the reason that, in the very full notice and history of it by Prof. A. J. Cook, published in the transactions of this society for 1872, at pages 459 to 462, some essential particulars seem to have escape his notice; besides which, it seems to be so decidedly winning upon the confidence of those who have, so far, made its acquaintance that we feel it to be important that the knowledge of its history and value be made as general and complete as possible.

The following account of its origin, and description and outline of the fruit, were contributed by me to the Michigan Farmer, and published in that journal, under date of November 12th, 1859. It was also copied into the February number of Hovey's Magazine of Horticulture for 1860.

The description and outline by Charles Downing:

"About medium in size, oblate, much depressed, angular, skin whitish, shaded, marbled, splashed and striped with rich crimson and moderately sprinkled with light dots; stalk rather short and small, inserted in a large uneven cavity; calyx closed, segments erect, sometimes a little recurved; basin large, open, slightly furrowed; flesh of snowy whiteness, very tender, juicy, with a brisk, refreshing, sub-acid flavor; quality 'very good.'

"This exceedingly beautiful apple was first brought to the notice of the writer last November, through the medium of J. T. Elliott, Esq., of Grand Rapids, from whom he received a few specimens of the fruit at that time. He is also this season (1859) indebted to Marvin

Wilcox, Esq., of Gaines' Station, Genesee county, Michigan, for another lot of the fruit, specimens of which were sent to Mr. Charles Downing of Newburgh, N. Y., author of the revised "Fruit and Fruit Trees of America," who, at the writer's request, has furnished the above outline and description for the Farmer.

"This fruit originated from the pomace of a lot of grafted fruit, grown in Ayon, Oakland county, the seeds from which were planted in a nursery, in Gaines, Genesee county. A portion of the trees grown from them were sold, ungrafted, to Mr. Beebe Truesdell, deceased, who planted them in Vernon, Shiawassee county. Among these was the original tree of this variety, which has now borne full and regular crops for more than ten years, with the exception of two seasons, when the crop was thinned by frost.

"The only grafts yet in bearing of this variety are those of Mr. Wilcox, although it has been considerably disseminated in the vicinity during the last two or three years. It is locally known as 'Nonsuch;' but, as this name is already applied to several other fruits, at the suggestion of the writer Mr. Wilcox has applied the name at the head of this article, a name eminently appropriate for so beautiful a fruit.

"In texture, juiciness and flavor, as well as in the beautiful whiteness of its flesh, it is much like the well known Snow apple (Fameuse), from which, when the skin is removed, it is hardly possible to distinguish it; and, as it seems to be free from the faults of that variety, it may prove a valuable substitute for it. The tree is a strong, rather upright grower, until the branches become borne down with the weight of the fruit. The fruit matures in November, and may be kept till February.

"The specimens sent the writer, this season, were picked early and prematurely ripened. Doubtless, from this cause, they were less finely colored than those sent last year; and, if memory can be relied on in such a matter, they are thought less rich in flavor. For these reasons they may be expected to improve upon further acquaintance.

"Plymouth, October 24, 1859.

T. T. LYON."

Mr. Wilcox, by request, forwarded me specimens of the fruit in the fall of 1860, which were exhibited at the meeting of the American Pomological Society, held at Philadelphia in September, 1860, where Mr. Hovey saw the fruit, secured an outline and description which accompanied a second and highly flattering notice of the variety subsequently published in his magazine. These specimens seem to have satisfied Mr. Hovey that this fruit is distinct from Fameuse (which he had previously doubted); but Mr. Downing, to whom I had repeatedly forwarded specimens, was for a considerable time in doubt on this point.

This variety has been in bearing for many years at Grand Rapids, as well as at other points, and in that locality especially we hear the most flattering reports of it. Indeed, although it has been thoroughly tried in comparatively few localities in Michigan, the results, so far, strongly indicate to our mind, that for its season of maturity, from October to February, it is the coming apple.

MANN APPLE.

As this is already introduced into our State, and seems to be attracting some attention for its alleged market qualities, we reproduce Mr. Downing's description of it, from the appendix to the revised edition of "Fruits and Fruit Trees of America," page 21. He says:

"A chance seedling, in the orchard of Judge Mooney, of Granby, N. Y. Tree hardy, an upright grower, with rather slender branches, forming a round head; an early and annual bearer, a late keeper, valuable for market and cooking, and a fair table fruit.

"Fruit medium to large, roundish oblate, nearly regular; skin deep yellow when fully ripe, often with a shade of brownish red when exposed, and thickly sprinkled with light and gray dots, a few being aureole; stalk short, rather small; cavity medium or quite large, sometimes slightly russeted; calyx generally closed; basin rather large, slightly corrugated; flesh yellowish, half fine,

half tender, juicy, mild, pleasant, sub-acid; good to very good; core medium; January to April."

GRATTAN

is a new apple, and the only one of strictly Michigan origin that has recently secured a place in the standard pomological literature of the day, so far as we now recollect. A history and description will be found in the appendix to Downing's revised edition, at page 12, as follows:

"This new large apple was grown from seed by Nehemiah Smith, of Grattan, but while quite young, before fruiting, was removed to the farm of Solomon Deal, of Oakfield, Michigan (both in Kent county). It is highly prized in that section for culinary purposes, as well as for the table. Tree vigorous, upright, forming a round, open head, producing good crops annually, and larger ones alternate years.

"Fruit large to very large, roundish oblate, slightly conic, regular; skin smooth, bright yellow, moderately sprinkled with grayish dots; stalk very short, small; cavity large, deep, sometimes slightly russeted; calyx open or partially closed; basin large, deep, nearly smooth; flesh yellowish, a little coarse, tender, juicy, sub-acid; good to very good; core small. September to December."

Coming as this does from the shelter and virgin soils of a comparatively new country, it can hardly be expected to maintain its local reputation in older soils and less favorable situations. Hence we would caution experimenters to test it thoroughly before planting largely.

SOMERSET

will be found described in Downing's appendix. Several years' trial of it in our orchards in eastern Michigan, has given us a very favorable impression of this as a desirable variety for the dessert, though we can by no means recommend it as a profitable market fruit. Downing says of it: "Of uncertain origin; supposed to have originated in the town of Somerset, N. Y. Tree vigorous, spreading; an annual bearer, but heavier crops every other year; a rich, high flavored apple, desirable for family use. Fruit below medium, roundish conical, much narrowed towards the calyx; skin whitish yellow, some nettings and patches of russet, and a few brown dots; stalk of medium length, slender; cavity medium; calyx closed, basin small, corrugated; flesh quite white, fine, very tender, juicy, rich, highly aromatic; very good or best; core medium. October."

In the appendix above spoken of will be found described nearly one hundred varieties of apples, nearly all of which seem to have been brought to the author's notice since the completion of the last revision of his work; of these, sixty have originated south of Michigan and New York, twenty-six north of the south line of those States, and ten are of European origin; one only—the Grattan—being of Michigan origin.

We may be expected to include in these notices, quite a list of what are known as "Iron Clads," such as Lawver, Pewaukee, Plum's Cider, Rolla, Stark, Walbridge, Wealthy and others, which the requirements of the arctico-torrid climate of the prairie States have developed into notice, for the reason that the more luscious, but unfortunately, less hardy old varieties of the east, fail to meet the severe requirements of their case. But, to Michigan planters, descriptions of these may be assumed to be of little value, since few if any intelligent planters here are likely to substitute them for such old and well tried

sorts as Fall Pippin, Rhode Island Greening, Baldwin, Hubbardston Nonsuch, Melon, and Red Canada, while the amount of matter pressing for consideration warns us to confine ourselves to that which comes more directly in the way of home wants.

SIBERIAN CRAB APPLES.

The trying climate of our Northwestern States has compelled planters in those States to select only the most hardy sorts; and so great is the necessity of the case, that a large number of what are known as "Iron Clads" have been introduced or originated in those States to meet this emergency. More recently the superior hardiness of the Siberian Crab (*Pyrus Baccata*) has invited the attention of experimenters, and the consequence has been the introduction of several very distinct varieties of this class, which threaten to nearly or quite usurp the places of the old favorites: Small Red, Large Red and Yellow, and even Hyslop, Montreal Beauty, and Transcendent.

To Michigan planters the importance of these is greatly diminished, from the fact of our ability to successfully grow so wide a range of the best varieties of the common apple (*Pyrus Malus*). Hence, in our State, crabs are but sparingly planted, and that mainly for culinary and ornamental purposes. Still these efforts for the amelioration or improvement of the crabs have resulted in the production of sorts which are claimed to be a decided improvement upon the other varieties in quality, while a still more advanced step has been taken in the production of varieties which extend the season of this fruit into winter and even spring. One of the most promising of these newer sorts, for the use of the Michigan planter, is believed to be

BRIER'S SWEET CRAB,

which was introduced to the public by A. G. Tuttle, of Baraboo Valley, Wis., and who thus describes it: "Originated with B. D. Brier, of Baraboo, Wis. Is the result of a fertilization of the Siberian Crab with the Bailey apple. Tree perfectly hardy, vigorous and productive. Fruit as large as the Transcendent, shaped like the Bailey Sweet, color pale yellow, beautifully pencilled and splashed with carmine, flesh yellowish, crisp, juicy, very sweet and rich; quality best for dessert or preserves." This has now been several years before the public and seems to possess more than usually desirable qualities for a fruit of its class.

BYERS' BEAUTY

is understood to have originated in Bainbridge, Berrien Co., this State, many years since, and, so far as we have been able to learn, was first exhibited, and received its name at the meeting of this society held at South Haven, Van Buren county, in September, 1873, as will be seen from the following extract from the report of proceedings at page 304 of its Transactions for that year:

"A basket of crab apples, raised by Jno. Byers, of Bainbridge, and shown by A. A. Olds, is worthy of much attention. A name is desired for the fruit, which is as yet known only as a seedling. Upon the question of naming the crab apple referred to in the report it was suggested that it be called Byers' Beauty, as the general opinion was that it was worth a name and due consideration by the society."

This variety is exceedingly beautiful in coloring, and distinct in form and general appearance. It is of about the size, season, and quality of Transcendent, and would do well to plant beside it for contrast. We regret to say, however, that we have reason to consider it as a comparatively weak and indifferent grower. We are given to understand that it is in process of propagation, and that it is not yet offered for sale.

MARENGO

is apparently the "*avant-courier*" of a new departure in the way of Siberian crab apples, it being one of the first of the long-keeping sorts with qualities adapting it to dessert uses. For the reason, apparently, that the true and original Marengo Crab attracted considerable attention, the name has been attached to several others, originating in the neighborhood, and claiming to possess similar or parallel qualifications. The original variety is thus described in Downing:

"The fruit is large for its class, in form roundish, flattened at blossom end, bright, warm red on yellow ground, smooth, with a few scattered gray or light russet dots. Flesh yellowish white, crisp, juicy, a little harsh until fully ripe, when it is a mild and pleasant sub-acid. Stalk long and slender, set in a narrow cavity, calyx closed. Basin broad, open, corrugated. Early winter to late in spring."

We extract the following from a letter received from J. F. Lester, of Marengo, Ill., the introducer of the above, under date of January 25, 1875:

"The tree in question and two others (winter crabs) were first noticed in the fall of 1866, growing in the grounds of Mr. C. Sponable of this place (Marengo, Ill.) The first tree, or what has been named "Marengo Winter," stood in orchard, the other two in an old nursery row. These rows were seedlings, and the practice of Mr. S. was to topgraft three to three and one half feet from the ground. There is no appearance on these trees that they have been grafted above the ground.

In February, 1867, I placed a few specimens of the "Marengo Winter Crab" on the tables at the winter meeting of the Northern Illinois Horticultural Society, not as a valuable apple, but as a curiosity, and perhaps as a desirable acquisition to the list of fruits.

"There are three other crab trees in this vicinity that have figured in with or as the Marengos,—one which I believe had been named "Kishwaukie," on the grounds of Mr. Walter Renwick. He informed me to-day that he purchased a lot of apple trees of C. H. Hibbard (formerly a nurseryman of this place), this being one of the lot. He (Renwick) thinks Mr. H. obtained his trees from Indiana.

"Another tree, five miles from here, called the 'Coral,' on the grounds of Mr. Wilcox. I learn from a nurseryman here (A. H. Vail) that Mr. W. told him that this tree came from Rochester, N. Y., with a lot of apple trees. It was apparently a worthless sprout, and was thrown away, but was afterwards picked up and planted to fill the row.

"The other tree will be passed, as the original proprietor has moved away. I may remark here, if there is any value in any of these crabs, the Marengo Winter and the Coral will cover the whole ground. The others will only tend to confuse and encumber the lists."

LADY ELGIN

is described in Downing's Appendix, with the synonym Marengo Siberian, No. 4, as follows:

"This beautiful new Siberian apple originated on the farm of James Forbes of Ridott township, Ill. Free, hardy, vigorous, upright, slender branches, very productive, a pleasant dessert fruit, and said to be excellent for canning; the slight acid or vinous flavor being preferred by some to the rich sweet of the peach. Fruit large for a Siberian, roundish oblate, regular; skin smooth, whitish yellow, nearly covered with bright rich red, a few light and gray dots; stalk medium, slender; cavity calyx closed; basin shallow, corrugated; flesh white, fine, tender, juicy, mild sub-acid, slightly vinous; very good. September and December."

SYLVAN SWEET

is another novelty among crabs, ripening in advance of their ordinary season. It was originated by Mrs. C. P. Alling, Sylvan, Richland county, Wisconsin. It is described as vigorous and suited to a northern latitude; the flesh tender, juicy, sweet. Fruit large for a crab, roundish oblate; skin smooth, light yellow, nearly covered with bright red. Stem long, slender; cavity medium; basin small; season last of August and first of September. It is represented as promising to be a valuable variety for cider.

In his appendix Mr. Downing notices as varieties of recent introduction: Bailey's Crimson Crab, originating with William H. Bailey of Patterson, N. Y.; McKie's Beauty Siberian, originating with Matthew Mackie, Clyde, N. Y.; and Van Wyck's Siberian, originating with Miss Caroline Van Wyck, Fishkill, Dutchess county, N. Y.

CHERRIES

(if we for the present omit blackberries) come next in alphabetical order.

In this fruit very little progress seems to have been accomplished since the wonderfully prolific results from the experiments of Dr. Jared P. Kirtland, of Cleveland, Ohio, some years since. Indeed, the cultivation of the cherry may be said to have retrograded since the advent of its enemy, the curculio, and more especially since the strawberry has come into so general cultivation, and has developed so many improved varieties which, in part at least, fill the season of the cherry.

THE LIEB

is a new cherry which has recently made its appearance in Iowa, similar to the Early Richmond, but much hardier and sweeter than that variety. This cannot properly be called a new variety, the parent tree having been brought from Germany about twenty-five years since. It is at present said to be in the possession of its introducer, Mr. Lieb, at Galena, Ill., after whom it is named.

The Iowa Homestead says the tree is "a botanical curiosity, the twig and bud strongly indicating their origin from the Morello family, while the leaf as strongly resembles those of the Duke family."

GRAPES

next demand our attention, and so multitudinous are the candidates for popular favor, and so rapidly do they arise to challenge the attention of the public, and so suddenly do their claims become dispelled by the searching tests of discriminating planters, that we are quite at a loss where to commence the examination, and at what point to close it. Under the pressure of these difficulties we omit all notice of any older than those comparatively recent sorts that seem not yet to have a settled reputation with the public.

IONA

has now been for several years in the hands of planters, and though conceded to be of the highest quality, experience with it has been so very variable that it must be conceded to lack some important quality essential to its highest success as a market grape. A communication from our friend B. Hathaway, of Cass county, Mich., published in a recent issue of the *Country Gentleman*, so clearly expresses our views of the matter that we indulge in the following extract:

"I am strongly impressed with the idea that the intrinsic value of this grape is not fully understood. That it is the best keeping native grape we have, cannot, I think, be questioned. Some of the Rogers' Hybrids are very good keepers, but none of them, so far as I know (and I have those counted the best), can compare with the Iona in this regard, besides being much below it in quality. That the Iona is more difficult to grow than the Concord and kindred varieties, must be conceded. That there cannot be as many pounds grown on the same ground, even with the best of handling, with any certainty of ripening, is also true. But I believe it is more certain than any of the Rogers grapes, being less subject to mildew, where given the required conditions, though it needs, as they do, winter protection.

"I have been more successful with this grape than I had reason to hope, and regret that I did not plant proportionally many more of this variety, even preferring it to the Delaware, which has done remarkably well also.

"With all its good qualities, however, it has some drawbacks. Only the intelligent cultivator will succeed; but then his success will be all the more remunerative. A vineyard of the Iona will not take care of itself: it must have the constant care of a vineyardist who knows its requirements. The land must be strong, naturally or artificially, thoroughly drained; must be well prepared before planting, most land requiring to be trenched from one to two feet deep, according to the nature of the soil, aspect, situation, etc. The vines, when of proper age, must have a trellis instead of stakes, for the advantages of thorough ventilation, and to allow them all the sunlight possible.

"The Ionia vine has just the habit of growth most desirable, neither too rampant nor too weak, though it requires considerable attention, while carrying a crop of fruit, to secure strongly-developed canes for the next year's fruiting. This is one of the most important points to be considered. It is also necessary to shorten the bearing-wood to about half of what would be proper for stronger-growing kinds, like Concord, Hartford, etc., although generally, owing to its familiar habit, there is comparatively but little new wood to be cut away. It requires less summer pinching than most other varieties, for the same reason, but must have some attention in this regard."

To the above we add the remark that, while we very distinctly concur in the above, our personal experience and observation indicate decidedly that the

Iona, under the treatment indicated, can be very satisfactorily grown, even upon comparatively light soils, provided they be dry and warm.

CROTON,

as all will doubtless recollect, originated with Stephen Underhill, of Croton Point, N. Y., from seed of Delaware, crossed by Chasselas. The fact of its semi-foreign parentage has, from its first introduction to the public, occasioned a fear that, sooner or later, it would be found wanting in hardiness or ability to resist mildew. Last season (1874) for the first, we saw indications of failure in this particular, and we have been given to understand that, even earlier than this it has been found wanting in this respect in some other localities. Still we are by no means disposed to condemn it, upon a single season's failure, and with so good a general record; but would rather suggest care in the choice of soils and aspects in which to plant it, and judicious pruning and management as helps to its possible weakness in this particular. It fills a place in our list for which we have, so far, no satisfactory substitute.

EUMELAN

has now been a number of years in the hands of planters, and has proved satisfactory so far as quality and general appearance are concerned. Still it does not seem to have secured a strong hold upon the confidence of the public, the reasons for which do not clearly appear, although it may be remarked that it is not always a good setter of fruit, and that it comes at the same season with several other desirable varieties, and although the flavor and size of the bunch are satisfactory, the seeds are large and many, besides which the vine, although a fair grower, does not seem to have established itself, in the estimation of vineyardists, as fully reliable and satisfactory. Indeed the variety must yet be said to be upon trial as a market grape.

ISRAELLA

came out contemporaneously with Iona, and doubtless has been less sought after for the reason that the taste of planters runs more after the light colored varieties. The vine is liable to the same objection that has so seriously affected the Diana, that on strong, moist soils it is inclined to grow too late to properly ripen its wood, as a consequence of which it fails to develop a sufficiency of fruit buds. The best evidence of the correctness of this assumption is the fact that, on light, warm, thoroughly drained soils, like Diana, it produces abundantly, and its fruit is, in its season, very satisfactory, though by no means ranking with Iona or Delaware.

MARTHA

was originated and introduced by Samuel Miller, formerly of Calmdale, Penn., and more recently of Bluffton, Missouri. The development of its qualities has been watched by the planting public with more than usual interest, for the reason that it promised to fill a place among white grapes for which it has no competitor, if we except the Rebecca, which could only be accepted for the purpose under protest, on account of the very unsatisfactory behavior of the vine. Martha has been found quite satisfactory, so far as the thrift and hardiness of the vine is concerned; but the fruit, although sweet, and of the desired color, has too much of the peculiar aroma, and generally objectionable qualities of the wild fox grape, to become acceptable to cultivators of educated olfactories or of refined taste.

WALTER

sprang from seed of Delaware, fertilized by pollen of the Diana, and originated with A. J. Caywood, of Poughkeepsie, N. Y. It has been for several years in the hands of experimental planters, and frequently comes to the surface at our Pomological gatherings, and accompanying exhibitions; but although the quality of the fruit is admitted to be satisfactory, its behavior does not seem, as a whole, to have been such as to commend it to public confidence. The best that can be said of it, for general purposes, is that it is still upon trial.

KALAMAZOO,

as most of us will doubtless recollect, has been before the public, upon the introduction of Judge Wells of Kalamazoo, Michigan, for three or four years, as a seedling from Ohio, of which the original stock was lost, leaving the variety solely in the hands of Michigan men. It will be recollected that last year, at the society's February meeting (if I mistake not), we read a note from one of the leading pomologists of Ohio, stating that he considered it at least probable that this supposed new variety would prove to be only the resurrection of an old sort,—the Bland or Bland's Virginia. Our informant encourages us to expect further information on the subject, but, so far, nothing additional has reached us. The fruit, as grown in Kalamazoo, is similar in color and flavor to Catawba, but decidedly earlier; and, although by no means equal in quality to that variety when well ripened, is so large and beautiful, both in bunch and berry, that it is earnestly to be hoped that it may prove desirable as a market variety for Michigan. We regret to be compelled to say that, so far, it seems not to have manifested the requisite qualities for this purpose. Still, with the very desirable market qualities of the fruit, it is to be hoped that the difficulties in the way of its success, for such purpose, may yet be obviated.

SENASQUA

is a hybrid between Concord and Black Prince, originating with the late Stephen Underhill, of Croton Point, N. Y. It came before the public contemporaneously with the Croton, and seems, so far, to have been partially eclipsed by the more pretentious claims of the latter. Its quality is highly spoken of, although Mr. Downing, in his work on fruits, remarks that "in consequence of its thin skin and compactness of bunch, the fruit is apt to crack, especially in wet weather." In our experience with it, we find its habit of growth to be stout and short-jointed, like Croton, and slightly like the Delaware, though more vigorous. It ripens with Concord, or a little before. The question of its relative value cannot be said to be yet settled.

WORDEN

is a new grape, grown by B. Smith of Meridian, N. Y., and which does not seem yet to have been offered for sale. At the recent (January) meeting of the Western New York Horticultural Society, this was spoken of as a variety "worthy of attention," and as having "much of the appearance of the Concord, both in bunch and berry; but it is perhaps rather larger than that variety, distinctly better in quality, and quite as early as the Hartford." Several persons doubted its qualities in some of these respects.

CHAMPION AND TOLMAN'S SEEDLING,

which had been supposed to be distinct varieties, were, at the same meeting, pronounced identical by Mr. Lay, who also characterized the variety as inferior on heavy soils.

THE ROGERS HYBRIDS

have been so long and so prominently before the public that little need be said of them. Of the entire list probably Wilder (No. 4) and Salem (No. 22) are more sought after by planters than any others. We are persuaded that a remark once made to us by Mr. Downing, to the effect that probably the whole of them will, ere long, be laid aside for lack of quality, will prove to have been prophetic.

THE ARNOLD HYBRIDS

were originated by Charles Arnold of Paris, Canada West; Antuchon (No. 5), from seed of Clinton crossed with Golden Chasselas, in 1859; Brant (No. 8), from seed of Clinton crossed with mixed foreign pollen; Canada (No. 16), from seed of Clinton crossed with Black St. Peters; Cornucopia (No. 2), from seed of Clinton crossed with St. Peters in 1859; Othello (No. 1), also a hybrid.

These are in the hands of trial planters, and have, doubtless with reason, excited some hopes of success, from the mere fact of their high northern origin; to which may be added the consideration that their female parent is but one remove from the native wild frost grape of our northern forests. Their true status as to hardiness, productiveness, etc., cannot yet be said to be determined.

THE WYLIE HYBRIDS

were originated by Dr. A. J. Wylie of Chester, South Carolina, and they attracted much attention at the exhibition of the American Pomological Society at Richmond, Va., in September, 1871, at which time they seem first to have been brought prominently into notice. Mr. Downing, in his appendix, describes two of them,—Janie Wylie and Peter Wylie,—both early sorts. Very little confidence seems to exist of their success at the north, although some of them are on trial among us, even in Michigan, with some favorable indications, of which, however, we at least do not feel warranted in speaking confidently.

THE RICKETTS HYBRIDS,

if we are to judge from the very high praise meted out to them by certain magnates of the pomological world, who have been among the very few privileged to touch and taste these coming wonders, must be commissioned to create a revolution in our ideas as to the possibilities of improvement in this direction. There are said to be the results of a series of hybridizations between the native and the foreign grape, and are alleged to have developed most surprising results in both the quality of the fruits and the vigor and hardiness of the plants.

These are very numerous and are the results of a series of experiments in hybridization by James H. Ricketts of Newburgh, N. Y. They have not yet been offered for sale, and are understood to be nearly or quite all yet in the hands of the originator. The very extraordinary statements respecting their qualities and general promise are from the publications of a few persons who have been permitted to take notes respecting some of them, when at maturity, in the grounds of the originator.

CAMPBELL'S SEEDLINGS.

The gentlemen so prominently associated, so many years since, with the introduction of the Delaware grape, Mr. George W. Campbell, of Delaware, Ohio, a few years since produced and offered for sale a "White Delaware," and some other novelties, which do not seem to have taken a strong hold upon

the popular appreciation. During the past autumn and this winter, however, he has brought out another new white grape, which he has named

LADY,

of which he publishes an outline, accompanied by the following description :

"After six years careful observation and testing the Lady grape, I have found it uniformly reliable, perfectly hardy and healthy, both in vine, fruit and foliage, as well as vigorous and productive. It is a pure Concord seedling, having all the best characteristics of that well known and popular grape, with greatly improved quality, and at least two weeks earlier ripening. It is what would be called a white grape, being, in color, a light, yellowish green, covered with white bloom, bunch medium large, the size of average Concords, handsome and moderately compact, skin thin, seeds few and very small, pulp tender and of equal character and consistence throughout, with no hard core in the centre, flavor rich, sweet, slightly vinous, somewhat like Concord, but much better, more refined and delicate, with no coarseness and scarcely a trace of foxiness or native aroma. No mildew of foliage or rot in the fruit has ever occurred, and during the severe winter of 1872-73, it endured 32° below zero uninjured."

The above of course will be taken as the statements of an interested party, which may not be fully realized by others, in different soils and varied aspects.

ITHACA,

a cross of Chasselas and Delaware ; Wyoming Red, a fox seedling, and Nathan C. Ely and Farmers' Club, seedlings originated by David Thompson, of Green Island, near Troy, N. Y., are urged upon public attention, as desirable new sorts, by S. J. Parker, M. D., of Ithaca, N. Y.

PEACHES

seem, in experimental hands, to readily yield a larger percentage of desirable results, and the experiments require a smaller amount of time for their maturity, than is found to be the case with most other fruits. In consonance with this fact, the production of new varieties of this fruit, of a highly promising character, within the last few years, is surprisingly large. We would especially invite attention to the several recent, very early sorts supposed, not without apparently good reasons, to owe their origin to Hale's Early, which seems, in addition to its value as an early and excellent fruit, destined to become the progenitor of a new, distinct, and wonderfully precious family of peaches.

FOSTER

is a peach originated about the year 1857, on the grounds of Capt. J. T. Foster, of Medford, Mass., from the stone of a peach purchased by him in Boston market. It is said to be hardy, with very large, dark, glossy and peculiar foliage, unlike that of any other variety. Fruit always large ; flesh yellow, rich, juicy, pleasant sub-acid, parting freely from the stone, which is of medium size ; color of fruit a deep orange and red, becoming very dark red on the exposed side. Season, middle and last of September. A very promising late market peach.

MOUNTAIN ROSE

is another comparatively new peach, promising to be valuable for market purposes, and, perhaps, destined to usurp the place of the Large Early York, with which it is in season, and which it seems calculated to eclipse, so far, at least, as beauty of appearance is concerned. Tree vigorous and very productive; glands globose; flowers small; fruit large; color dark rich red; flesh white, stained red at the stone, juicy, sweet, slightly vinous, separating freely from the stone. In season the last of August and first of September.

ATLANTA

is a new peach, originated by Dr. E. Ware Sylvester, of Lyons, N. Y., and is, as yet, but sparsely distributed. It is a free grower and productive, with reniform glands; fruit medium sized; skin whitish, shaded, and dotted with deep red, and nearly purple in the sun; flesh stained with red at the stone, to which it slightly adheres; flavor rich, sweet. Ripe last of September.

RICHMOND

is another of Dr. Sylvester's seedlings, according to whose description the tree is vigorous and very productive; glands reniform; fruit medium to large; skin a fine yellow, mottled with dark, rich red; flesh yellow, red at the stone, juicy, melting, sweet, vinous, free from the medium-sized stone, less acid and a little later than Early Crawford. A promising market variety.

SALWAY

is a peach originated by the late Thomas Rivers, of Sawbridgeworth, near London, England. The tree is said to be vigorous, and very productive. Flowers small, glands reniform; fruit large, roundish oblate, with a broad, deep suture, extending beyond the apex; skin downy, creamy yellow, with a warm, rich, clear, crimson red cheek in the sun; flesh deep yellow, red at the stone, which is free, juicy, melting, rich, sweet, slightly vinous; very good. It ripens soon after the Smock,—so late that its success in Michigan may be doubtful, except, possibly, at the south.

SOUTHWICK'S LATE

originated as an accidental seedling with Mr. Southwick, of Dansville, N. Y. Tree vigorous and productive. Flowers small; fruit large, roundish, a little depressed at the apex; suture distinct; mamelon small, sunken nearly to a level with the parts around; skin yellowish white, sprinkled with minute red dots in the shade, and streaked and clouded with red next the sun; flesh white, parting freely from the stone, very juicy and melting, with a fine, delicate flavor, stone very small. Ripe last of September.

THE RIVERS PEACHES.

Some years since the late Thomas Rivers, of Sawbridgeworth, England, so long known to the horticultural world as one of the most Americanlike of Englishmen, and as always an ardent and persevering experimenter in the pomological field, undertook a series of experiments for the origination of new varieties of peaches; and he seems to have accomplished a most wonderful success, whether we consider the number of these productions or their great beauty and reported earliness and high quality. Among them the following have been introduced into this country, some of which have already fruited on this side of the water. We describe and class them, as nearly as practicable, in the order of ripening, as given by the originator, and, with the exception of the first three, nearly in his own language:

Early Beatrice—Named for a member of the royal family of England, is the first if not the only one of these peaches that has, so far, been extensively fruited for market in this country. "S. G. Bilyeu of Halifax county, N. C., was the first to set large orchards of these peaches in the United States. He saw them at Mr. Rivers' place in England, side by side with Hale's Early; Beatrice was ripe eighteen days ahead. Mr. Bilyeu began to pick his Early Beatrice June 10th, 1871. In 1872 he shipped 150 bushels to New York and Philadelphia. In 1873 there was a heavy crop on some 500 trees. Hale's Early, in the same orchard, was fourteen to eighteen days later. In wet weather Hale's rotted green, while Beatrice ripened up finely, and perfectly free from rot." Colonel E. W. Wilkins of Maryland, one of the largest peach growers in this country, after seeing the Beatrice orchard in North Carolina, planted an orchard of 15,000 trees of Beatrice, when trees cost \$50 per 100.

This success has created for it such a reputation as a market fruit that it is extensively sought after for that purpose. Foliage with reniform glands; flowers large; fruit medium, with a marbled red cheek; flesh melting, very juicy. A spurious variety, with globose glands, was, in 1873, somewhat disseminated under this name in this State, but the error seems now to have been corrected, the spurious trees proving to be Early Crawford.

Early Louise—Also named for one of the English royal family, is of medium size, bright red; flesh melting, juicy, excellent, parting freely from the stone. Ripens a few days earlier than the Early Rivers, and nearly as early as the Beatrice. Glands reniform; flowers small. It is claimed to be larger than Beatrice, and of higher quality, very little if any less valuable.

Early Rivers is another of these peaches; named for the originator. Glands reniform; flowers large; fruit large, pale straw color, with a delicate pink cheek; flesh melting, remarkably rich and racy. Season, soon after Early Louise and considerably in advance of Hale's. Good judges, who have fruited it in this country, consider it the best of all the very early varieties. Raised from Early Silver, and the third generation from New White Nectarine.

Early Leopold—Medium size; pale yellow and red; very rich and excellent; glands kidney-shaped; flowers small; succeeds Early Rivers.

Dagmar—Large; melting and rich; skin very downy and of a deep crimson; very handsome; ripe early in August.

Early Albert—Large; nearly oval; melting and excellent; succeeds the Early York.

Early Alfred—Above medium size; melting and peculiarly rich and agreeable; a most delicious freestone peach; season early in August.

Early Silver—Very large; melting and rich, with the vinous flavor of the White Nectarine, its parent; season early in August.

Rivers' Early York—Medium size; skin marbled with red; flesh so melting and juicy as to dissolve in the mouth, leaving no fibre; season early in August.

Large Early Mignonne—Very large; pale straw color, with a rosy cheek; melting and very rich; ripens the first week in August.

Dr. Hogg—Large; firm, yet melting; often stained with red under the skin; flavor rich and sugary; a freestone; hardy, vigorous and prolific; season middle of August.

Crimson Galande—Medium size, often large; deep crimson; flesh tender, melting, rich, and deliciously flavored; a freestone of the most hardy, prolific and vigorous habit; season middle to end of August.

Magdala—Size medium; shape inclined to oval; skin nearly smooth, like a

nectarine; color creamy white, marbled and blotched with crimson; flavor a combination of the peach and nectarine; quite original and exquisite; season middle to end of August.

Princess of Wales—Very large; one of the largest peaches known, and one of the most beautiful; its color cream, with a rosy cheek; melting, rich and excellent; season first to middle of September.

Prince of Wales—Very large; color deep crimson; melting, rich and excellent; a very fine peach; season middle of September.

Nectarine Peach—Very large; pointed, with a smooth, nectarine-like skin; flesh melting, rich and racy; season middle of September.

Lord Palmerston—Very large: the largest of peaches; skin creamy white with a pink cheek; flesh firm, yet melting, very juicy and rich; season middle to end of September.

Lady Palmerston—Large; melting and very good; skin greenish-yellow, marbled with crimson; very handsome; flesh pale yellow. This fine peach ripens toward the end of September, and is a most distinct variety.

Comet—Large; nearly round; orange, with a crimson cheek; melting, sweet and good; season early in October.

Of these only the first three can properly be said to have even laid the foundation of a reputation in this country, although the high promise of those may be accepted as encouragement to a prompt trial of the remaining sorts. The eminent success of the peach in our American climate creates a strong probability that at least some of these aliens, with royal and lordly names, may be found to take kindly to the brighter suns and more virgin soils of unaristocratic America.

Alexander is a more recent candidate for popularity, it having first come prominently before the public in the fall of 1873.

While peach growers were wondering whether the climax of earliness had not been reached by Mr. Rivers of Europe, with the Beatrice, this phenomenon was heralded from the prairies of central Illinois, in vindication of the American reputation for keeping up with the times,—an important matter if, in this case, we would sustain our arrogated reputation of possessing the *homæ*, par excellence, of this fruit.

We add a few items of the history of its origin from the originator, O. A. Alexander of Logan county, Ill., under date of 1873:

"Four years ago a few peach trees, including the one that subsequently bore this fruit, sprang up accidentally in my garden, and the succeeding spring were transferred elsewhere. This one was selected for its more perfect symmetry, and set near the house for its shade, not suspecting its real character. Last year (1872) it blossomed and set a moderate quantity of fruit, which, at an early stage, showed a decided superiority of growth. The first specimens were plucked July 18th in good eating condition. July 25th, when these were nearly all far advanced in ripeness, making a display of beauty such as peach trees seldom exhibit, and I may venture to add never excel, the Hale's Early were still green, and little more than half grown."

In noticing specimens sent for examination, Mr. Charles Downing says:

"The Alexander's Early peach is very handsome and regular in form, and if it proves as early in the future, it will be a great acquisition, both for the amateur and for market. It is not as sweet as some kinds, but the vinous flavor is rich and good; the flesh is thick and quite firm, which will enable it to carry well long distances to market."

There were those who feared that this unusual earliness might be the result of disease, but an examination of the tree and fruit seems to have allayed this fear, and subsequent observation and experience with the variety seems to have

effectually demonstrated its futility. Mr. Alexander says: "The fairest statement I can make of the time of ripening of each is July 20th for Alexander, and August 10th for the Hale's Early." It should be stated that this is in latitude 40°.

In the absence of any distinct description of the fruit we can only say that it is represented as a large, brilliantly colored, pale-fleshed peach, of vinous flavor, and partially adhering to the stone. Tree vigorous, foliage with globose glands, flowers large; season, for Michigan, yet uncertain.

The original tree is reported to have recently died from the operations of the peach-tree borer.

AMSDEN'S JUNE.

While we were endeavoring to accommodate our preconceived notions to the possibility of having acquired a peach three weeks in advance of Hale's Early; a voice comes up from the remote regions of Missouri, heralding the advent of yet another early peach of the same wonderful precocity as compared with Hale's Early, and we are challenged to accept the apparently extravagant claim, upon the faith of certificates from such pomologists as Charles Downing, Patrick Barry, J. J. Thomas, John A. Warder, Thomas Meehan, and others, to whom specimens of the fruit, and also of Hale's Early, grown beside it, had been sent for examination and comparison, and whose unqualified endorsement of the fruit, as to size, quality, beauty, and earliness, must be supposed to dissipate all doubt as to these points, so far as the original locality (latitude 37°) is concerned. How far this extraordinary precocity and high quality will be maintained, in the climate and soils of Michigan is, of course, to some extent an uncertain matter; but trees are being distributed among the planters of the State, and hence the problem will soon be in process of solution. The original tree, as stated by the introducer, is an accidental seedling, and first fruited in 1872, and it was budded upon a quantity of young thrifty stocks the same season, which also bore fruit in 1874, fully sustaining its earlier promise. The originator describes it as follows:

"Fruit medium size; decidedly larger than Hale's Early; roundish, a little flattened; with a slight suture; colored, beautifully shaded, and mottled very dark red, nearly covering the greenish white ground; flesh white or greenish white, rather firm until fully ripe, becoming tender, juicy, melting, sweet and delicious; freestone, but the flesh adheres somewhat to the small stone; fruit remarkably fragrant; flowers large; leaves with globose glands; tree vigorous, hardy and very productive."

To the above is added the endorsement of the Jasper county, Mo., Horticultural Society; and also of the County Grange of Patrons of Husbandry.

The originator further writes us that he has another seedling, originating at the same time with the preceding, but fruiting a year later, which, he thinks, will prove yet a little earlier, and of very similar quality; of this, however, we are inclined to await the proof, before indulging in sanguine anticipations.

Besides the varieties already noticed, there are numerous others of more or less apparent promise, though few if any of them seem possessed of qualities especially valuable to Michigan planters.

PEARS

seem to yield more reluctantly than most other fruits to the ameliorating influences of cultivation, and since the days of Van Mons, of Belgium, and of the amateurs of our country whose operations may be supposed, in some degree at least, to have been inspired by his enthusiasm, or by its results, there seems to have been, to a great extent, a lull in the effort for artificial production of new varieties of this fruit, in corroboration of which we may call attention to the fact, that since the introduction of Dana's Seedlings and Clapp's Favorite, we hear of no introductions of new pears, past, present, or prospective, other than from accidental sources, unless it be some of the numerous ones constantly coming to us from Europe.

DANA'S HOVEY

cannot properly be spoken of as a new pear, and yet it is so seldom planted in our State that we are compelled to suppose that its very high quality and great merits generally as an amateur fruit, are not properly understood. We the more readily accept this supposition, for the reason that it fills a season, for at least a portion of which, it may be said to have, at present, no proper competitor. Though rather small for a market fruit, it is of the very highest quality. Season November to January.

CLAPP'S FAVORITE,

although introduced since the preceding, is much more generally planted, and is assuming some prominence as a market fruit on account of its fine size and showy appearance. Its chief drawback for such purpose is a very decided tendency to rot at the core, as does the Flemish beauty, which is one of its parents. Aside from this objection it may be said to have no superior, of its season, for general purposes.

EDMONDS

is a recent American pear, originating at Brighton, N. Y., as a chance seedling on the farm of Eliphalet Edmonds. The strong, vigorous habit of the tree, and its productiveness, with the fine size and attractive color of the fruit, coupled with fine quality, indicate that it will prove a good market sort. Its season—September—is the most serious apparent objection to it, as it will come when there is the greatest probable surplus of superior fruit.

MOUNT VERNON

is also a chance seedling, which originated on the grounds of Samuel Walker, of Roxbury, Mass., some time since deceased, and by him named as above. We are surprised that prominent nurserymen seem to be pressing this upon public attention, as it is by no means a new fruit. We well recollect that at one of the latest meetings of the American Pomological Society, which Mr. Walker attended (at New York in 1856 or 1858), this pear (as we understand) was discussed, and some of its members thought it should be recommended by the society, to which Mr. Walker very conscientiously objected, for the reason that he thought it not quite good enough. Our surprise arises from the consideration that so little progress has been made that to-day it is practicable to pass a fruit upon the public as valuable and desirable that was not thought good enough to warrant such a step fifteen or twenty years ago. Of course, it is possible that Mr. Walker possessed the very unusual tendency to undervalue his own production. Downing's work characterizes it as a very

vigorous grower, and an early bearer. Fruit medium or above, of good appearance, and in quality "very good." Season November and December.

SOUVENIR DU CONGRESS

is a pear attracting considerable attention on this side of the ocean, but originating in France, the originator, M. Morel, dedicating it to the Pomological Congress of France: hence its name.

The fruit is large or very large, in form like Bartlett; skin yellow, with the exposed side bright red or carmine; flesh musky, like Bartlett, though in a less degree. Season last of August and beginning of September. Tree vigorous, productive; of pyramidal habit.

Our wide-awake American amateurs are in the habit of closely watching the European novelties of the day, and of importing the same. Hence eastern experimenters are seldom without a very considerable number of these recent, and yet untested introductions which, as they come into bearing, become represented upon the tables and in the discussions of eastern culturists. A very considerable list of varieties now undergoing this process might be here presented, but the unexpected length of these notes warns us to leave them to await the weeding process. We only note that the American Pomological Society's Committee on Foreign Fruits, at its last session, and also the Western New York Horticultural Society, at its session one year since, recommended the following as possessing more than ordinary merit:

Beurre Samoyeau, medium size, last of September and first of October; Madame Desportes, medium size, September and October; Abbe de Beaumont, medium size, August and September; Eugene Appert, medium size, without season; Rolmaston Duchesse, medium size, October.

PLUMS

have for so long a period been subjected to the reign of the curculio that the enthusiasm of experimenters for the origination of new varieties seems to have fallen nearly or quite to zero. Hence there is little to chronicle in the way of novelties, the little that is attempted being mainly in the direction of curculio-proof sorts.

MINER.

is an improved variety of the wild or Chickasaw plum, and received its name from its originator, a Mr. Miner, of Lancaster, Pa. Fruit medium, oblong and pointed at the apex; skin dark, purplish red, covered with bloom. Flesh soft, juicy, vinous, adhering to the stone. Season, October. Its thick, tough skin enables it to resist the operations of the "Little Turk" to some extent, while it is said to be hardy enough to withstand the trying winters of our northwestern States.

WILD GOOSE

is a name conferred upon a variety of our native Chickasaw plum, as report has it, from the alleged fact that the seed which produced the original tree was found in the stomach of a wild goose.

The readers of the now defunct *Journal of Horticulture* may recall the fact that, in one of its last volumes, it gave cuts, with descriptions of three or more distinct sorts, under this name; originating, if we mistake not, in the State of Tennessee. From this it would appear that the name is, in some quarters at least, considered as a sort of generic title.

Mr. Downing, in his work, describes a single variety under this name, as follows:

"An improved variety of the Chickasaw, evident in the greater vigor of the tree and increased size of the fruit, which is nearly as large as a Green Gage. Skin purple with a blue bloom. Flesh juicy, sweet; adheres to the stone. Last of July."

WEAVER

is a new plum, being disseminated in the west, and which is said to be of desirable quality. It was discovered by the individual whose name it bears, on Cedar River, Iowa, and was introduced to general notice in 1873. The introducers describe it as "of fine size, good flavor; a freestone, with firm flesh. A close observation of twenty years has determined it to be perfectly hardy. An abundant bearer, and absolutely curculio-proof." The color is yellow with a red cheek. A friend who is acquainted with it describes it as larger than Lombard, and in quality superior to Miner. It is a seedling of the Wild or Chickasaw plum.

JODOIGNE GREEN GAGE.

Size and form a good Green Gage; beautifully marked with purple; fine quality. September.

QUINCES.

REA'S SEEDLING,

more commonly known as "Mammoth," is described in Downing's work as "a new seedling raised by Joseph Rea, Coxsackie, Green county, New York. It is a superb fruit, averaging one-third larger than the apple or orange quince, of the same form and color, fair and handsome, and equally as good, and by some preferred, to the apple quince for culinary purposes. Tree healthy, a thrifty grower and moderately productive; an acquisition."

SWEET QUINCE

is an old sort from Chambersburgh, Penn., just introduced, and described in appendix to Downing's work. Fruit only less acid than other kinds, keeps late, and cooks tender. Otherwise much like apple quince.

BLACKBERRIES

as a fruit for cultivation, have only begun to attract attention within a comparatively few years, as formerly the neglected lands and fence corners adequately supplied the demand, and we have even now only progressed so far as

to select and propagate the most promising natural seedlings to supply our plantations. Judging from the number of "new and promising" sorts to which the attention of planters is from time to time being called, there is not likely soon to occur a lack of supply from this source. Among those of recent introduction we notice

MASON'S MOUNTAIN,

a new sort claiming to be hardy. Fruit black, large, conical, sweet, rich.

MISSOURI MAMMOTH,

of which Downing's work says: "A variety recently disseminated from Missouri. It has not yet fruited here, but is described as 'bearing fruit of the very largest size, quite black, firm, rich, juicy, sweet, without any core. Ripens very early and continues a long time in bearing.'"

NEWMAN'S THORNLESS

was thought to be a promising sort, but does not seem to have produced equal to the anticipations of its friends. Canes with but a few thorns.

HOOSAC THORNLESS,

a new blackberry described in the May number of the Horticulturist for 1874 as follows: "Discovered in Massachusetts in 1864, and carried to Ohio; said to be very hardy, and stood the winter of 1872-3 without injury; quality of fruit sweet and melting; flesh firm, productiveness remarkable; bearing canes are described as absolutely thornless. The new growth, however, has a few small thorns on the under side of the leaf stalks; these shed off when the leaf falls, and the brush can be handled as readily as willow twigs."

ANCIENT BRITAIN

is new and comparatively little known. It is represented as very hardy and prolific.

BARNARD'S SEEDLING

is also new, and is highly spoken of by those who have made its acquaintance.

WESTERN TRIUMPH

is noticed with a decided flourish by the editor of the *Rural New Yorker*, who invested in the plants at \$5 per dozen, and seems to consider it as a satisfactory investment. He highly commends the variety for hardiness, vigor, high quality and productiveness.

CURRENTS AND GOOSEBERRIES

do not seem to afford anything of importance in the way of recent varieties.

RASPBERRIES

are much called for in our markets, and cultivators appear to watch the advent of new sorts with much interest, an interest which doubtless derives edge from

the fact of the cheapness and ease of the process of introduction and testing. Among the new raspberries introduced or about to be introduced will be found the following:

ARNOLD'S SEEDLINGS,

of which three have been offered to the public and are described in Downing's work, as Orange, Red, and White Canada, are originated and introduced by Charles Arnold, of Paris, Ontario, C. W., the originator also of the Arnold's Hybrid grapes already spoken of. These raspberries are very highly spoken of, so far as quality and possibly even productiveness are concerned, but they do not as yet assume any degree of prominence, at least for market purposes.

HERSTINE

is a very promising variety, which, though of the Antwerp class, is said to be hardy. Its great vigor and productiveness render it a promising sort for market purposes, although the fruit may prove rather tender for carrying long distances. Berry, large, roundish, obtuse conical, bright scarlet, flesh moderately firm, juicy, sweet, rich, separates freely from the core.

ONTARIO

is a new Black Cap, discovered and introduced by E. E. Lord, of Fairport, N. Y. Plant hardy, vigorous, very productive. Fruit firm enough to bear carriage to a distant market; large of its class, deep black, with a very thick, bluish bloom, juicy, sweet and very good.

NARRAGANSET

is a new red variety, raised by John F. Jolls, of Providence, R. I., said to be large, very productive, keeping in good condition for a long time. Berry conical, and of fine flavor, bright scarlet. Promising for market.

GANARGUA

is a still more recent candidate for the favor of planters, claiming to combine the valuable and hardy qualities of a black cap with the finer flavor and diminished seediness of the reds. The introducers describe it as "a very large red berry of the cap or tip-growing species, but having the red berry flavor, very firm, hardy and more productive than any berry with which we are acquainted. It originated on the farm of S. B. Katkamier, Ontario county, N. Y. It ripens a week before any other raspberry, while its habit of throwing up bearing shoots from low down on the bearing canes, prolongs the crop and adds both to its size and productiveness."

The report of the recent annual meeting of the Western N. Y. Horticultural Society speaks of this also in the most flattering terms.

STRAWBERRIES

are the last fruit to which it seems important to invite the attention of Michigan planters; and so fickle is this fruit in its choice of locality, climate, and soil, and consequently so varied are the estimates placed upon the same variety, in localities but slightly removed from each other; and furthermore, so readily do new sorts spring up and establish themselves in the good graces of planters,

acquiring at least a local name and reputation, while they may, perchance, be utterly condemned or ignored elsewhere, that we are quite at a loss, if not where to begin, at least where to end the list of new varieties worthy of being brought to the notice of planters. Modes of culture, even, oftentimes influence the productiveness, size, or appearance of a variety to such extent as, to the mind of the planter, to determine the conclusion as to success or failure. So far is this true, that it has come to be a recognized fact, that almost the entire list of European strawberries must, to give any considerable degree of satisfaction in our climate, be treated with hill culture, while even then, our success with them is only partial. For these reasons we omit foreign sorts, notwithstanding the partial success of a few; and, with those of native origin, we content ourselves with naming the following somewhat extended list of those brought to notice within a comparatively few years, with a special mention of such of them as may have been most generally commended, viz: America, Black Defiance, Boudinot, Boyden's No. 30 (Seth Boyden), Charles Downing, Col. Cheney, Cowing's Seedling, Cumberland Triumph, Dr. Warder, Early Queen, French, Golden Defiance, Golden Perpetual, Golden Queen, Keech's 2,200, Kentucky, Kissena, Kohocken, Kramer, Late Prolific, Lennig's White, Matilda, Monarch of the West, New Jersey Scarlet, Romeyn's Seedling, Springdale.

Of these, several will be found described in our standard pomological works, and others have been more or less favorably noticed in the current publications of the day, while a few of them are, as yet, and possibly will continue to be, confined to the catalogues or circulars of the parties who may be disseminating, or who have originated them.

Boyden's 30 (which we understand to be the fruit frequently called "Seth Boyden") is by connoisseurs considered as "the coming market strawberry."

Charles Downing is clearly winning the highest confidence of growers.

Cowing's Seedling is characterized by the introducer as the largest berry in cultivation, vigorous, hardy, and of great promise.

French is a fine early sort for planting in private gardens.

Golden Perpetual is a curiosity, producing a continuous crop till frost, on the young runners which fruit before taking root. Berry large and excellent. Kentucky is rapidly accumulating reputation as a profitable very late sort. Lennig's White is "best" in quality, and of good size, but lacks productiveness. New Jersey Scarlet is desirable as an early sort, though only moderately productive.

At the meeting of this society held at Adrian, in June, 1874, notwithstanding the somewhat late date, and the severe drouth then prevailing, there were shown several fine collections of strawberries. One of these, which especially attracted our attention, but which, so far as we now recollect, was, if at all, not prominently noticed by the proper committee, was a collection of seedlings exhibited by H. E. Bidwell, of South Haven, Van Buren county, Michigan, but of which, in the absence of the exhibitor, we were at the time unable to obtain an account of the origin; while, not being one of the examining committee, we were not in the position to form an opinion as to their quality.

MANURE—ITS TREATMENT AND VALUE.

READ AT THE WINTER MEETING OF THE STATE POMOLOGICAL SOCIETY
AT LANSING, BY FRANK A. GULLEY, DEARBORN.

GENTLEMEN: The success and profits of a farmer or gardener do not depend on the number of his acres, nor on the variety and extent of his crops, but on the amount produced per acre above the cost price.

Assuming this to be a fact, the question arises, In what manner can we increase this extra production? After land has been drained and prepared for cultivation, the two principal agents are manure and thorough cultivation; and to the first I wish to call your attention for a few minutes.

INCREASE OF THE VALUE OF MANURE.

Fifteen years ago livery stable men in Detroit gave away their manure, and frequently had to hire it removed. During the winter of 1858 and 1859 my father was furnished with a team to draw the manure away from a brick yard stable near Detroit, although he had to haul it nine miles. The M. C. R. R. would then draw manure from their cattle yards and throw it off in front of the farm for one dollar per car load. At present manure is worth in the vicinity of Detroit from 50 cents to \$1.50 per wagon load. I know of a stable where 100 horses are kept, that receives \$350 a year for the manure. D. M. Ferry & Co. expended \$10,000 in manure for their seed farm situated two and a half miles from Detroit in 1873. We pay a dollar a load for all the manure we can get within five miles, drawing it ourselves.

I give these few figures to show how highly manure is valued by men who are using large quantities of it, and also to show how rapidly the value of manure is increasing in the estimation of our farmers and gardeners.

HOW WE MANUFACTURE MANURE.

Being engaged in working a garden farm distant twelve miles from Detroit, and finding it rather expensive to draw manure that distance, we have been for several years trying the experiment of manufacturing it on the farm. Our plan consists in breeding and rearing pigs, and feeding cattle during the winter. Up to the past year we bought nearly all our feed, raising no hay and but little grain. We are now renting land for the purpose of raising feed, and paying from three to six dollars an acre.

WHEN A GOOD INVESTMENT.

If we can make our sales of pork and pigs, and the amount received for the

cattle after deducting their cost, equal the value of feed consumed, letting the manure balance the work, we consider it a good investment.

PROFIT ON THE PIGS.

But we find we can do better than this by keeping the small-boned, fine bred pigs, and judicious and heavy feeding, and taking the value of the manure into consideration, we think we can compete with the western farmers in raising pork. Our pigs during the past year have returned \$1,000 over the value of feed consumed on pigs sold for pork and feeding, while at the same time we are establishing a herd of thoroughbred pigs. But we expect a greater profit on the increased production of crops caused by the use of this manure.

HOW WE TREAT THIN STEERS.

We make a practice of buying thin steers in the fall, either two, three, or four years old, which cost us from \$20 to \$50 each; these are fed until in good condition and then sold at from 50 to 100 per cent advance.

FEEDING CATTLE.

There are a class of farmers who raise cattle till they are two, three, or four years old, merely giving them feed enough to keep them alive and make them grow; and this class of farmers are found all over our State. We can buy these cattle, feed them heavily three or four months, and get nearly as much for feeding them that length of time as the man who raised them did for keeping them two or three years. But it is not done by a slipshod way of feeding. Our cattle are kept in warm stables and fed regularly on cut hay, straw, and stalks, mixed with pulped roots, and all the steamed corn meal and mill feed they will bear.

THE BEST WAY TO MAKE MANURE.

There is probably no way in which manure can be made with less trouble, experience, and expense than in feeding cattle winters. It is a practice which I believe could be adopted with success by gardeners in any vicinity where manure is scarce and feed can be bought at a reasonable price. I am satisfied that it can be done successfully in the vicinity of Detroit, and that is probably as good a market for farm produce as there is in the State. It does not require a very great expenditure for buildings or machinery; an old barn or shed can be fitted up with gates and mangers at an expense of one or two dollars per head, with stanchions, or where cattle are tied with ropes the expense would be less, but the extra amount of work will more than balance the cost of gates.

I fitted up a shed floor for twenty-five head, with gates and mangers at an expense of seventy-five cents per head for lumber and nails, and it was all made portable so that it could be taken down and packed up summers, so that the building can be used for other purposes.

A PLAN OF A CATTLE SHED.

I have a plan of a cattle shed that we propose to put up next fall, that may be built either by itself or as a lean-to by the side of a barn, with a gate between each animal, manger and all complete, and be as convenient and comfortable as a cattle shed for feeding need be, and it will require but 2,000 feet of lumber for every ten head of cattle, and any man who can use a saw, square, and hammer can build it. As this would hold nothing but cattle, another

building would be required for storing feed, cutting machine, etc. One of the best and largest feed-cutters in the market can be bought for \$65. A four-horse-sweep power will cost new from \$40 to \$75. We are using a root pulper that I built myself with the help of a blacksmith, that cost me \$12 besides my own labor, and it will grind fifty bushels of ruta bagas or beets an hour with three horses.

At present we are using an old threshing-machine horse power, but expect soon to put up an engine. We have tried several farm mills for doing our own grinding, but have found none that were profitable to use with horse power.

THE PROFIT OF SHEEP.

Not being in a sheep country, and not having given the matter much study, I cannot speak in regard to their value as producers of manure. In some parts of our State they may be more profitable than either cattle or pigs.

A COMMON PRACTICE.

Many farmers clean out their stables and pile the manure up against the side of the barn from fall till spring. The manure ferments or heats, and, when the spring rains come, the water from the eaves falls on the pile and the greater part of all that was valuable passes off in gas, or is leached out and carried off into the nearest ditch. When drawn out in the spring, the manure is worth little more than a jag of wet straw.

LOCATION OF BARNYARD.

I have known men who were considered good farmers who have built a splendid barn with arrangements for keeping considerable stock, and make their barnyard on a slope or side hill, so that not only the rains from the roof, but even water from land back of the yard, during heavy rains, would wash out the manure, carrying it off into a creek or ditch below. A barnyard should be on level ground that is higher than the surrounding fields, if possible, so that water will never run into the yard. There should be no open ditches coming into the yard, nor near enough for the wash of the yard to run off in. A few rods of tile drains put in ditches near the yard would obviate this difficulty. Tile drains should also be put around the yard and through it, if necessary, sufficient to keep it dry.

WATER IN BARNYARD.

There are times when a barnyard will get flooded with water. This water will take up a certain portion of the strength of the manure, and if it runs off into a ditch it is a total loss, while if it runs off on to a cultivated field or grass lot, or, better yet, on to some material that will absorb it, a large portion of it might be saved.

HOW WE TREATED OUR BARNYARD.

Having a yard that had been dug down until it was lower than the surrounding land, and having been obliged to let the water off several times through a tile drain, losing a large quantity of manure thereby, we last summer carted enough sand and clay into the yard to raise it two feet, and arranged it so that the waste would run off on to a low piece of ground near the yard; this low spot was thoroughly tile-drained, and over it we have spread a thick coating of muck. We propose to draw this muck out every year and put it on the compost heap, drawing in more to take its place. If I were going to put my barns on a new place, I would first locate the yard with reference to

the arrangements for manure, and then put the barn where it would be most convenient.

OBJECT OF A BARN.

Generally speaking, the object of a barn on a farm is to store the feed and shelter the stock. The main object of keeping ordinary stock on a farm should be the production of manure. Therefore, in arranging the farm buildings, this matter should be borne in mind.

If I had a barnyard on a slope or side hill, I would take a plow and throw up a little ridge or bank on the upper side above the yard so that no water could run into it. I would also throw up a bank around the lower side, so that the wash could not run off, and put tile drains under that bank, letting them run up a short distance under the yard, and over this lower part of the yard I would put a layer of muck or some other absorbent, so that the wash from the higher parts of the yard would be filtered through this material and pass off in the tile drains.

VALUE OF DIFFERENT MANURES.

The following values of manure produced by feeding different kinds of food is taken from a table prepared by John B. Lawes, of England:

The value of manure made by feeding one ton of peas is \$13 38; one ton of corn meal, \$6 65; one ton of wheat, \$7 08; one ton of wheat bran, \$15 59; one ton oats, \$7 70; one ton oat straw, \$2 90; one ton wheat straw, \$2 68; one ton clover hay, \$9 64; one ton timothy hay, \$6 43; one ton mangel wurzel, \$1 07; one ton ruta bagas, \$0 91.

COMPARATIVE VALUES.

These are what we might call comparative values; that is, it gives us an idea of the comparative values of manures produced by feeding different kinds of foods. We can't say that a ton of hay or corn fed to an animal will produce a quantity of manure that is worth to use so many dollars and cents.

A certain quantity of manure applied to a crop on a particular soil might be worth in increased production \$50, applied to the same, or another crop, on a cold, wet, or unproductive soil, it might be worth \$5, or possibly nothing. The actual value of the manure would be the same, but the value of the benefit derived from its use would depend a good deal on our skill and judgment in using it.

Now, I do not say that a ton of the various kinds of food spoken of in this table will make manure that is worth to use on ordinary farm lands the values here given. But I do believe that it will make manure that is worth that much to use on highly cultivated garden land near a good market.

I know that we could not estimate the value of the manure that is in our yards by that table and afford to sell it at that valuation. Or to express it more plainly, if I should take the amount of feed consumed on our farm during the year, and compute the value of the manure made by that table, we could afford to pay that for the manure, if we could not get any more.

The amount of crops produced by the farm in one season, with the application of this manure, greater than the amount that would be produced without it, would more than equal in cash value the computed valuation of the manure.

MANY FARMERS

think that manure may be a good thing for gardeners who raise heavy and exhaustive crops, but that it is too much trouble and costs too much to handle

for them to use. Particularly is this the case with farmers who have naturally fertile soils.

There may be some excuse for not making and using manure on new, rich land where labor is scarce and high, but in all the older settled portions of this State it will pay to make and use it.

PROFIT.

On a piece of land put in our hands to work last spring, was a field of twenty-one acres, that the owners wished to have sowed to oats, and seeded to clover. The field had been cropped several years without manure. The soil was of an average fertility all over the field. A crop of corn planted on it the previous year had made about an equal growth in all parts, and all so poor that it was not considered worth husking, and was fed in the stalk. On the farm was a pile of manure one year old, left from a cow stable, that we were directed to put on this field. The pile would have made about twenty or twenty-five such loads as we buy for a dollar. I estimated it was worth \$35. After the ground had been plowed, we spread this manure as evenly as possible over twelve acres on one side of the field, at an expense of \$15 for handling the manure. The twelve acres manured yielded 543 bushels, or 49 bushels to the acre; the nine acres unmanured yielded 180 bushels, or 20 bushels to the acre. The manure increased the crop 29 bushels to the acre, or 303 bushels on the farm, worth fifty cents per bushel, or \$151.50. The cost of preparing ground, seed, sowing and reaping, was the same per acre on the whole field. The cost of binding, drawing and threshing was more on the manured portion, but as the straw was twice as heavy we will let that balance the extra work. The manure and drawing cost \$60, therefore \$50 expended in manure made an increase in the crop of \$151.50, or a profit of \$101.50 in one season. In addition to this the clover made a good catch on the manured land, while on the rest it hardly grew at all.

MARSH MUCK.

There is something about marsh muck that seems to have a remarkable effect on old land, especially on light soil, and particularly on garden land that has been heavily cropped and manured for several years. It seems to have somewhat the same effect that is caused by plowing under green crops. I have known good crops of onions raised on sandy soil for two years, by a heavy application of muck, and a light sprinkling of leached ashes. On old onion beds the tendency of onions is to ripen too early, or before they get their growth, thereby decreasing the crop. By using muck and a variety of other manures, we can raise good crops on the same land for years in succession. They will do better to change the crop. But as it is expensive fitting ground in proper shape for onions, and as it is the most certain and profitable crop that we raise, we find it does not pay to change often.

ONIONS.

We have raised onions on the same ground for seven years in succession, never having a profit of less than \$175 to the acre, and the last two crops yielded as well as any.

MUCK APPLIED TO RASPBERRIES.

We have applied muck alone and composted with manure to various crops, and always with success. We have applied muck to raspberries, three or four shovelfuls to the hill, and increased the yield one-quarter.

MUCK AS AN ABSORBENT.

As the handling of muck is somewhat expensive, the principal value to farmers may be in using it as litter to absorb the liquid manure that would otherwise be wasted. A few inches of muck spread over a barnyard in the fall, where stock are kept, will be worth almost as much in the spring as the manure from the stables. Where stock is kept either in stables or yards, there should be sufficient litter to absorb the liquid manure. Dana says the urine voided from a cow in one year, compared with Peruvian guano at \$50 per ton, is worth \$20.

STRAW

is generally considered the best litter; but in many places is too valuable for feed or market to use for this purpose. Dry muck, earth, leaves, or sawdust are nearly if not quite as good. We prefer to use dry muck with a little straw for the animals to lie on, for both cattle and pigs. Cattle should not be allowed to stand in roads or lanes where the manure dropped will be lost. If the water is some distance from the barn, they should be watered, driven back and put in the yard.

HOW WE HANDLE MUCK.

We handle muck as follows: Our marsh or muck bed is a mile from the barnyard, and is dry in the summer and fall, but generally wet through the winter and spring. We keep a man, two horses and carts, with a boy to drive, drawing out this muck and piling it up by the side of the marsh on high ground, at all times through the season, when we can spare them. In the winter, when the ground is frozen and the men and teams are not busy, we draw it home. The following is our plan of handling or making a compost heap:

A COMPOST HEAP.

Our main barnyard is about 100 feet square. In this are kept during the winter from 50 to 100 store pigs, and the cattle are turned into it about two hours every day, just after noon. In the fall we covered the yard with six or eight inches of muck, and on one side covering nearly half the yard we are making the compost heap. The stables and pig pens are cleaned out every other day and the manure put on this heap; at the same time we are drawing on muck, also all the leached ashes, manure, etc., that we can pick up and buy in the nearest villages and neighborhood. We manage to have the muck all frozen, and when we put on ashes are careful to cover them with muck so that there will be no escape of ammonia. We take particular pains to get all the refuse of the farm onto this heap. In the spring the muck that was spread on the rest of the yard is carted up onto the top of the heap, and fresh muck put in its place. The heap will then be four or five feet high and packed solid by the working and tramping of the cattle and pigs.

After the spring crops are in, whenever a man can be spared, or if it too wet to work on the crops for a day, half-day, or even an hour, all hands work at turning over this heap. It is a standing job for all idle times. The object of turning it over is to break it up, mix it thoroughly and start fermentation. After the pile is turned, if it gets too dry or ferments so rapidly that gas escapes, we will run a pipe from our windmill water tank and moisten it sufficiently to keep it in the proper condition. This compost will be ready to apply either in the fall, winter, or spring.

THE APPLICATION OF MANURE.

After it is well composted our practice is to apply it at any time when there is not a crop on the ground and other work is not pressing. For early spring crops I would rather put on manure in the fall and plow it under; but as this is a driving season with us, we draw on the larger part during the winter when our men and horses are not busy. The objection to applying manure in the spring where large quantities are used, is that driving over the ground makes tracks that will remain lumpy and interfere with the cultivation nearly all summer, particularly if the spring is wet. It would not be advisable to apply manure in the winter to sloping ground where the spring rains would wash it off, nor in heaps large enough to ferment.

ON THE FARM OF MR. WILLIAM SMITH,

the gentleman who makes such a fine show of fat cattle and pigs at our State fair, the manure is drawn on in haying time as fast as the grass is cut. The men and teams work at the manure mornings while the dew is on, and on wet days; by this means the extra force of men employed at that season have no lost time. This farm is essentially a grass farm.

THE MOST ECONOMICAL WAY

of drawing on heavy applications of manure, where the field is near the yard, is in using two carts with a man to load and boy to drive, dumping the loads regularly over the field. A man will spread more manure in a day standing on the ground than he will from a wagon, and get it more evenly distributed.

FOR LIGHT APPLICATION

it would undoubtedly be a saving of time to draw and spread from wagons. A good man with the right tools will load from 60 to 100 cart loads in a day, and a man will spread from 80 to 125 loads.

THE BEST TOOLS

we have found for handling manure or compost, are the Partridge four and six-tined forks. They are made of the best steel, are strong and very light. A man will handle about a quarter more manure with these forks in a day than with the ordinary fork and shovel.

For ordinary farm crops and some garden stuff we prefer to apply manure to the surface of the ground after it is plowed, working it in with a cultivator or harrow.

But for such crops as onions, carrots, and parsnips, the seed of which germinate slowly and with little vitality, if a heavy coating of manure is applied to the surface and worked in but one or two inches, and there happens to be a long dry time soon after the seed sprouts, a large portion of it will die out.

AN EXPERIMENT.

Last spring on two onion beds side by side, on one of which the manure was harrowed in and on the other plowed in four inches deep, and plowed up again, the seeds nearly all came up on both beds; the ground was very dry, and in two weeks about one-half of the plants on the bed where the manure was left on the surface had died out; the other nearly all grew. If we could depend on having spring showers, I would rather apply to the surface.

GENERAL CONCLUSIONS.

We cannot make rules for making, handling and using manure, for all the soils, crops, markets, and especially labor, must be taken into account. The plan that would be profitable for one would not for another. There are a few general principles that we can use, modifying them to suit our various circumstances. Keeping up and increasing the fertility of the soil is one of the most important questions, financially, to the tiller of the soil. It is a matter we can all study with profit.

ORDER AND NEATNESS.

A PAPER READ BEFORE THE STATE POMOLOGICAL SOCIETY AT LANSING, FEBRUARY 10, 1875, BY JAMES SATTERLEE, VICE PRESIDENT FOR MONTCALM COUNTY.

It is a matter of regret to me that one so little acquainted with horticulture, in its various branches, should be chosen by this Society to present a paper on Order and Neatness.

What I know of horticulture is connected mostly with a farm orchard and a kitchen garden. With the raising and marketing of the different kinds of fruit, and gardening for profit, I know but little. You will therefore pardon me if what I have to say is connected as much with agriculture as with horticulture.

THE VALUE

of order and neatness in the care and culture of our farms, orchards and gardens is probably appreciated by all. As far as our observation goes, however, they are the exception rather than the rule. There are, of course, many things of which to take account in the consideration of the subject. New and unsubdued lands, value of hand labor, pursuing the extensive system in our husbandry and attempting more than we can possibly accomplish, all produce a tendency to carelessness and slovenliness in the management of our lands. All these, however, ought not to produce the disorder and want of system so common with many who till the soil.

I said the value of order and neatness is probably appreciated by all; yet the lack of a correct taste and the knowledge of certain principles cause many of us to fall far short of any true standard of excellence. We all admire a farm with substantial and neat buildings, well arranged fields, good fences, clean culture, and everything in all its appointments exactly adapted to the purpose for which it was designed. We seldom see such a farm, but when we do, we may be certain that its perfection has been brought about by good judgment, good taste and an adherence to the principles of orderly and systematic management.

THE PRINCIPAL TROUBLE

with those who lack order and neatness in the management of their lands is due to the want of a proper training or education in early life. They were allowed to form habits of carelessness, which habits led them to do their work in an improper and incomplete manner; the same habits follow them through

life. How seldom it is that a youth on the farm is taught just how work ought to be done, and then made to do it right. This is not the case with other business pursuits. With manufacturers, with merchants, with bankers, order and system are the rule, and not the exception. Hence, we see that many of these men upon becoming farmers have better arranged farms and are better farmers, in reality, than many who have tilled the soil for a life time. Order in the management of their work has become natural to them. They have been trained in early life in the way they should go, and they do not depart from it when they are old. I consider this matter of education of the first importance. If in our first lessons we are taught the use and care of tools, their relation to weeds, and their relation to useful plants, those lessons will be remembered as long as life lasts. But these lessons cannot be taught by precept alone; they must be taught by example, as well. And so many are lacking in the knowledge that will enable them to set a right example. Our agricultural and horticultural journals are doing a good work so far as precept goes; and our Pomological Society is doing a good work in the right direction by enabling us to get acquainted with each other's systems and modes of doing work. Besides these, we need some plan whereby our youth may obtain instruction of a practical kind; instruction that will enable them to project and execute work with neatness and dispatch, and without any mistakes.

OUR AGRICULTURAL COLLEGE

supplies this plan. We would that its efforts were better appreciated by the agriculturists and horticulturists of our State. Its halls ought to be filled to overflowing every year with young men eager and anxious to learn the best and most approved plans for doing all kinds of farm and garden work—not only this, but the care and use of tools, the laying out of grounds, the care of lawns, with their walks and drives, and everything, in fact, that pertains to the tasteful and successful management of a complete agricultural or horticultural establishment. A knowledge of this kind, together with an acquaintance with the sciences most intimately connected with agricultural and horticultural pursuits, cannot fail to make intelligent, useful, and successful tillers of the soil. The influence of the College is extending, not as fast as it ought, certainly, but it is surely extending, and in the right direction. It is well for us to encourage it, support it, and lend it our aid in every way consistent with truth and right. It is doing a work for us that no other institution of learning can do, and its halls deserve to be filled with the best youth of our State. But there are many, of course, who can not avail themselves of its advantages, and many others who would not if they could. It remains for those who do enjoy these advantages to adhere to and carry out the instruction received there. Although we may labor at a disadvantage with ignorant help, prejudiced neighbors, and many other untoward circumstances, there are no obstacles that can not be overcome if our practice is founded on true principles,—principles we have seen adopted and carried to a successful issue.

We learn that it is always best to form our plans beforehand, and then adhere to them just as far as possible. In this way we save time and avoid many mistakes. It is easier to get our help to carry out the plans we have made if we have something definite, something they can understand and see the benefit of. Do not be afraid to tell them what you intend to accomplish, and, in order to do this, it is necessary to employ intelligent and willing help. It is better to pay for intelligence than muscle when we hire, unless it is for digging

ditches or work of that kind. Intelligence comprehends why a certain thing is to be done in a certain way to accomplish a given result; muscle comprehends nothing. Unless our plans are formed beforehand, and in a comprehensive and definite manner, they are liable to become frustrated; and they are always liable to unless we can give to them a certain amount of personal supervision. This is absolutely necessary. It matters not how well we have made our arrangements, they will not be carried out unless we give direction and a certain amount of assistance with our own hands.

We may be greatly aided in the discovery of our errors in management or arrangement

BY VISITING OUR NEIGHBORS OR FRIENDS

in different parts of the State. There are none so negligent or so poor that they cannot teach us something, in one way or another. Yet we think this visiting difficult. Few of us have time for such things. We ought to take time. We should find ourselves repaid in more ways than one. There is too much isolation among those who till the soil. Too much selfishness keeps us away from each other. The efforts now being made to bring us nearer together, socially, may be of great benefit if carried in the right direction. It is the grinding together of humanity that rouses to action and breaks up old habits arising from ignorance, prejudice, and seclusion. It is this coming together for social intercourse that will teach us what methods of culture are most profitable, what arrangement of buildings is most economical and best adapted to certain purposes. It will teach us where to buy our trees, our machinery, and many other facts, the ignorance of which makes men liable to be imposed upon.

Perhaps all this has little connection with my subject; and yet it has a certain connection, for everything that makes the tiller of the soil more social and better informed contributes directly

TO THE IMPROVEMENT OF HIS TASTE

in the care of his tools and management of his farm, orchards and gardens. Observing our orderly and economical neighbor's nice arrangement for storing his improved implements, and the pains he takes to dispose of rubbish that accumulates, will cause us to look about in the corners of our fences and out-of-the-way places and see if we are proud to have our premises inspected by our more thrifty associates. Perhaps it will lead us to think of the doubtful economy and actual untidiness of leaving everything where it was last used. I will venture the assertion that exposure destroys more tools than use does. However, this practice of careless exposure is becoming less common as we have better and more expensive implements than formerly. The manufacturers are putting it within our power to procure tools, the symmetry and finish of which cannot be excelled. All are adapted to the progressive times in which we live; and these times are progressive. Men are inquiring what are the most profitable and successful methods of doing all kinds of work; what are the best breeds of stock; what are the best varieties of fruit. These and many similar subjects are being investigated, not without benefit to all engaged in agricultural and horticultural pursuits.

We also see an

IMPROVED TASTE

in the arrangement of buildings and the more substantial manner in which they are built; and yet there is great room for improvement in this direction. So few leave space enough for their buildings when they arrange their fields and grounds. The orchard and gardens crowd so close upon them that there is no room to extend or re-arrange without breaking up the convenience and symmetry of the whole. There is no excuse for this when we clear up and subdue a new farm. Make your plan sufficiently comprehensive on the start, so that it can be added to with economy and still preserve the symmetry and convenience of the whole. In the arrangement of the farm, if we are to pursue a general system of husbandry (and that is the most profitable for the majority in the interior of the State), have fields enough for a proper rotation of crops without having two or more in a single field. I am not among those who believe that fences are only a bill of expense. Where timber is as plenty and land as cheap, and labor as dear as it is anywhere in Michigan, do not be afraid to build fences,—and good substantial ones, too. Rail fences are cheaper than board, although perhaps not so neat; yet, when properly constructed, kept in good repair and the briers and apple-limbs kept out of their corners, there is nothing untidy in a rail fence. Leave room enough for a grove and grass plat near your barns. They will be exceedingly refreshing to stock in our hot summer days. A nice grove left near the house or on the windward side, not far away, will add greatly to the comfort and beauty of a home. A grove will need less care than a nicely finished lawn; and yet a smooth grass plat in front of the house should never be omitted. It should also extend around to the rear of the house. This will add as much to one's own comfort as the part in front. There is nothing more conducive to slovenliness than tomato vines, chicken-coops and a chip-yard in close proximity to the back door.

Take advantage of any natural deformity if you can not conveniently remove it. A pile of stones, or any unsightly outbuilding, may be covered or hidden by a growth of Virginia creeper, and thus made a thing of beauty instead of deformity.

I would not be understood, however, as advocating too much space for lawn and groves, for to keep them in good condition takes time; and, if there is any great extent, more time than most people can economically spare. Unless they are kept orderly and neat, they might better be devoted to the raising of profitable crops of hay or grain.

In closing this subject of

ORDER AND NEATNESS,

I will say that my paper is of necessity short, for there is no fixed and exact definition of what they are made up. It would vary in the difference of location, and with every different individual. There can be no definite rules laid down. The subject is of a practical nature; hence the difficulty of illustration in a paper of this character. And yet, however practical they may be, their true development depends on the development of our æsthetic natures and our love of everything beautiful and symmetrical. And this depends on the right kind of practical education and illustration to guide our habits and tastes in the right direction.

WHERE TO OBTAIN OUR FRUIT TREES.

READ BY A. G. GULLEY, BEFORE THE STATE POMOLOGICAL SOCIETY AT
LANSING, FEBRUARY 9, 1875.

The large number of fruit trees now being planted in Michigan has given rise to the important question as to how and where shall we obtain our nursery stock. Shall we depend on our own State nurseries, or can we, without detriment to ourselves or stock, send to other States for a supply?

It is well known that large quantities of trees are coming into the State every year, and it may be well for planters to consider if it is necessary or for their interest to send elsewhere for trees. This question is rendered still more important on account of the serious damage done to the stock of this and other western States in the winter of 1872 and 1873, and the past winter.

It may be well first to speak of two items sometimes considered in purchasing stock for planting, but which ought never to be taken into account. They are: cost, and the distance which it is transported. Good trees should always be obtained, no matter what the first cost. A planter can better afford to pay a great price for trees of good quality and adapted to his location, than to plant poor stock if he could get it for nothing. However, the prices of trees in the different States, except those west, are so near alike that all can deliver them at our doors at about the same rate. But western trees grow so much faster and easier, they can be sold much cheaper than Michigan or eastern nurserymen can grow them. But this is no exception to our rule to pay a good price for good trees. Many persons prefer eastern stock, yet do not like to buy it, owing to the distance it has to be shipped. This need never be an objection. Every nurseryman, of any importance, each season packs and ships trees that go hundreds of miles without any injury. Indeed, each year there are large amounts of stock imported that has traveled thousands of miles, and yet arrives in perfect order. A planter need not hesitate on this point if he wishes to obtain trees from a distance.

The largest portion of the nursery stock of the United States is grown in five States: New York, Ohio, Michigan, Indiana and Illinois,—New York alone furnishing more than all the rest. In the first three the nurseries are usually on heavy or loamy soil, making the quality of the stock, so far as that is concerned, much the same. The trees not being forced make a hardy growth, and in ordinary seasons the wood is ripened early and well prepared for the cold weather. In Indiana and Illinois the trees are grown on what is known as

prairie land, which, being very strong, causes them to make a rapid but tender growth and late continued, leaving them in the fall but poorly prepared for our severe winters. This was clearly proven by the immense losses sustained by the nurserymen of these States two years ago, the trees in many instances being killed outright, and not simply frozen back as in this State. This killing back, so far as I have learned, was not serious in Ohio, and scarcely took place at all in New York.

In climate and temperature the tree-growing States much resemble each other, New York being, perhaps, the nearest like our own, but generally having more snow and not subject to those sudden and severe changes often experienced here. Ohio differs only in being a little milder. In the matter of climate, therefore, we have but little choice, and, if the answer to our topic depended on this alone, it might easily be given. Simply get trees from a climate as near as possible like our own. However, there is one gross violation of this law of climate, and that, too, in connection with the tenderest of our fruits,—the peach. On the warm, sandy soils of New Jersey and Delaware, large quantities of peach trees of the finest quality are grown,—far finer and at a much less cost than they can be grown by northern nurserymen. Hence the latter purchase them largely and supply their customers. Their origin not being known, their fine appearance makes them give good satisfaction. If the planter loses a large per cent he, supposing they were grown by the firm of whom he purchased, attributes it to some other cause. This practice cannot be too greatly condemned. Here, again, applies our rule of avoiding cheap trees. Another point to be considered is that of stock damaged by winter killing. This, when not killed entirely, has been headed back to the ground and grown again, and is, apparently, as healthy as before. But may not this killing back permanently affect the health of the tree?

Having no experience with this class of stock I cannot say, but speak of it hoping to hear the subject discussed, as this would have an important bearing as to where to get our trees.

Having decided where to get our stock, we must look to the means of attaining it. If one lives near a reliable nursery, or is intending to plant largely, probably his best plan will be to go and personally select his trees and see to the packing and shipping. This will always prove satisfactory. Or he can send his order by mail and have the order shipped to him. This in most cases will do as well. Still another way is to order of traveling salesmen, who are to be found in nearly all places every season. These are either dealers or authorized agents, and it is not easy to distinguish between them. The latter should always have certificates of late date of the firm they represent. The dealers also sometimes have these when they are honest-dealing men. The stock furnished by agents is true to name, but sometimes not of as good quality as that delivered by dealers. The latter buy their stocks and have to stand their own losses, hence they look well to the quality; but sometimes not caring so much about the variety. Both dealers and agents deliver the stock without extra expense, and if a person is planting but a small lot for family use, this mode of obtaining trees will do as well as any. There is one class of agents of whom all should beware,—those selling new varieties, which they claim to be better than old, well-tried lots, and, of course, asking a much higher price for them.

A planter should also avoid those nurserymen that practice digging stock in the fall and heeling it in out of doors over the winter. Some do this to a great

extent, as it enables them to ship earlier in the spring. But it is very much to the detriment of the trees. This, however, does not apply to trees properly heeled in cellars or other well-protected places.

There is still another method of obtaining trees,—that of home-growing. This plan I do not think of much importance. Fruit-growers do not generally have the time or experience necessary to attend to the details of propagation. But if one has the time he can derive much pleasure, and, perhaps, profit, and always be sure to have the varieties he desires. No doubt he would find the experience obtained of much value in selecting trees from large nurseries, and also in the after care of his own orchards.

To sum up then, the fruit-growers of this State should not plant southern or western grown trees. Indeed, there is no occasion for them to leave the State for stock, unless it is proven that trees hurt by the winters are permanently injured, in which case they must rely on New York. On the other hand, if a planter prefers eastern trees, by all means purchase there, only be careful to get first-class, healthy stock, and from responsible nurserymen.

PRUNING PEACH TREES.

ADDRESS BY A. S. DYCKMAN, BEFORE THE MICHIGAN STATE POMOLOGICAL SOCIETY AT LANSING, FEBRUARY 9, 1875.

MR. PRESIDENT—At the meeting of our Society at Adrian, last June, in giving some notes on the subject of Michigan peach culture, allusion was made to the system of pruning observed in our practice for many years.

As the views there enunciated were opposed to very high authority, with which, in one instance, our Secretary, in his report, did us the honor to collate them; and as, very naturally, they have been the subject of criticism among our fruit growers, we are glad of the opportunity your invitation gives to present a more detailed account of our theory and practice.

Mr. Downing undoubtedly considered the peach tree the best illustration of the benefits of the "*shortening in*" system of pruning, for in the chapter on peaches and in relation to peach culture his very able argument is presented.

This brings us, then, in direct issue with the acknowledged best authority in this country.

Mr. Downing's definition of "*shortening in*" is: "The cutting off *half the last year's growth* over the whole outside of the head of the tree, and also upon the inner branches."

He gives as the result of this practice, "a *thick, low, bushy* head, filled with healthy young wood, and, in the summer, with an abundance of dark green, healthy foliage, and handsome fruit."

To one who, like Mr. Downing, had been utterly disgusted with the neglected, scurvy, moss-grown, bare, bark-bound, sprawling branches of peach-trees, struggling for mere existence, and hiding in fence corners only to make their deformity more apparent, it would not be strange if he should fall into an opposite error, and take as his ideal of perfection a "thick bushy head."

We presume no practical peach grower will deny that the effect of a "thick bushy head" is to induce mildew and rot, and deprive the fruit of color and quality, to which the air and sunlight are so indispensable.

It is not difficult to observe these effects in varieties predisposed to rot,—like the Hale's Early and Michigan Yellow Rarripe.

Perhaps some may acknowledge that this, as presented by Mr. Downing, is not the correct ideal of a perfect peach tree, and still hold we may have a fine open top consistent with the "*shortening in*" process.

Then, we answer, you must procure it at no "little cost."

Let us take, for instance, a single spur or shoot of last year's growth and, in Downing's language, "*only* shorten in:" the limb being one foot long, and located on the outside or surface of the head.

Now cut off half of it, and we have a stub six inches long. On bearing trees to which only this theory applies there is little likelihood of any wood growth starting from this stub more than three inches from its base, and any fruit setting beyond this new wood growth might as well be picked off at once. Around the base of this stub new growth will start in several directions, at a safe estimate say not less than an average of three shoots from each stub.

Now it is easy to calculate for a series of years, as the number of shoots will increase by a geometrical ratio of three, while the distance of separation at their base will not exceed one inch, and the result of any one year's growth will not extend the "*base of operations*" more than three inches in any given direction.

The first year will give three limbs with a single limb at the base. The second year nine limbs with a base not exceeding six inches in diameter. The third year twenty-seven limbs with a base not exceeding twelve inches in diameter. The fourth year eighty-one limbs with a base not exceeding eighteen inches in diameter.

These limbs, growing of course upward or outward, would, at a distance of nine inches from the original base, approximate within a distance not exceeding three inches of each other, converging rapidly from this line inward where alone the bearing wood for the present year is located.

Suppose, at the beginning of this experiment, the first stubs were nine inches apart, the overlapping would double the diversity, to say nothing of the present year's growth which, even without leaves, would hardly find space to creep through this network of branches.

It would not do to talk of peaches twelve inches in circumference to be grown in this mass of limbs and foliage.

Of course no tree could bear such crowding; but when the experiment has been carried to the verge of possibility, what will be the effect? Instead of "*healthy young wood, and dark green foliage,*" described by Downing, will be seen a multitude of spindling, smothered branches, with a sort of half life, pining for the air and sunlight of heaven, to be stricken, in their feebleness, by the first blast of winter; and present the following year an array of dead brush sufficient to discourage even a fruit grower.

To those who would follow strictly this "shortening in" practice, there is no escape from these evils, except by persistent thinning of the young wood during the growing season, which, in an orchard of any considerable size, would involve a hopeless amount of labor.

Will it pay to go over an orchard of large bearing trees cutting off half of every young shoot when this only brings us into an unfortunate *dilemma*: in one direction lies mildew, decayed fruit, feeble growth and wood; in the other endless labor and diminished profits, if not bankruptcy?

Questions of economy, always important, become of the very first consequence when the average sales are reduced to a point near the cost of production.

We must study cheaper methods wherever they can be made as effective.

We hope no one will construe these remarks to favor neglect of any essential provisions for the production of the very best qualities of tree and fruit. On the contrary, we would direct every energy to the development of quality, quantity being always subordinate. But we would study cheapness in the

methods. This we think can be best accomplished by working near to nature and in observance of her methods.

When it is observed that the central small growth of a tree is dying or dead, there is evidence that nature cannot sustain so dense growth; and if we act upon this intimation, will we not thin the top to admit the air and light?

When nature closes the season, with a well-formed termination of each limb, repined and provided to form a suitable base for the next season's growth, shall we place her at fault; cut away half of this natural section of a tree, and force to a sort of abnormal growth; do this systematically, make it a formula of our practice?

Certainly not, if some less radical and less expensive process will reach the desired result.

Our experience with the peach has been on the east shore of Lake Michigan, where well matured wood of the peach was never known to winter-kill, and perhaps these notes will only apply to this and other localities having a lake temperature in winter.

"Shortening in" may be a necessary practice where the peach wood is frequently injured by winter cold.

We offer the following theory of pruning, only as the result of a few years' study in the midst of bearing peach trees:

As setting the bud in the side of the stock gives a little inclination to the tree, we, in planting, set this side of the tree towards the west or southwest to brace against the winds.

At the first pruning, at the time of setting, we cut away all the lateral branches (not so close as to destroy the buds at their base), and also a portion of the top, having in view the formation of a head with branches two and a half or three feet from the ground.

The tree puts forth an abundance of shoots, from which we select three, as nearly equidistant as possible, as leaders or main branches. This number is sufficient to form a well-proportioned head from the first, while more than this will very soon present a crowded head, and the difficulty will increase with the increased age of the tree.

These three branches growing upward and outward at an angle of about forty-five degrees, with their lateral branches kept always in subordination, leave an open center where the health-giving air can have free access, and hues of the sunlight reach to the inmost bearing twig. This gives a head of the finest symmetry, and most convenient for handling in pruning, thinning, and picking fruit.

These three primary branches properly started, the subsequent pruning is comparatively easy. An annual winter pruning is sufficient, with only the rubbing off of a few water shoots in summer.

Our prevailing idea in this winter pruning is *thinning*. We *pit* this term "thinning" against the term "shortening in" as capable of accomplishing all the good results claimed for the latter.

One effect of thinning is to induce a stocky growth of wood. Take, for instance, three or four limbs growing close together. Any lateral branches they may throw out will be feeble, while the terminal shoot will make the principle growth. Now, cut away all but one of these limbs, the remaining one having the space of the three or four, will be able to throw out strong, healthy laterals, and develop a fine, vigorous main limb. This process carried through the entire tree will lessen the growth on the extremities without diminishing the

aggregate. Thus the tendency to long, straggling, unfruitful branches may be overcome.

This thinning is done, not by shortening the young limbs, but by cutting them out entire to their junction with the parent limb, leaving each remaining shoot in the perfection of its natural growth.

Another effect of this "thinning" process is to distribute fruit-bearing wood through the interior of the tree top, where the burden can be borne with less liability to break the main limbs than where the fruit is borne mostly on the extremities in the case of a "thick-head," which will inevitably smother out the interior shoots.

Another effect of this thinning process is not only to reduce the number of fruit-buds but to materially increase their distances apart, thus performing an important part of annual fruit-thinning.

Another effect of this "thinning process" is to admit air and sunlight through the top,—preventing mildew and rot and imparting rich qualities and high color to the fruit.

Another effect of this "thinning process" is to promote the general vigor and health of the tree,—where each individual shoot has its equal share of air, light, and warmth.

Another effect of this "thinning process" is to make the fruit more uniform in size, color, and quality throughout the tree.

Another effect of this "thinning process" is to make the interior fruit more accessible to the picker than when one has to crowd through a mass of thick brush, alive or dead.

Another effect of this "thinning process" is to supply every bearing shoot, wherever located, with healthy dark green leaves, having ample space for the performance of their office in the production of fruit.

Another effect of this "thinning process" is to "thicken" the greenbacks in the fruit-grower's pocket; for it brings all these fine qualities in tree and fruit at a less outlay of labor and money than by the process of "shortening in,"—if the same results were possible by the latter system.

In conclusion, if it be not assuming, let us say to the fruit-growers of Michigan, prune your trees thoroughly but judiciously. Watch the suggestions of nature, and come to her rescue with a quick but cunning hand. Or, in the language of the poet:

"All superfluous branches lop away,
That bearing boughs may live."

AN ADDRESS ON PRUNING THE PEACH, READ AT THE WINTER MEETING OF THE STATE POMOLOGICAL SOCIETY, HELD AT LANSING
FEBRUARY 9, 1875, BY D. R. WATERS OF SPRING LAKE.

GENTLEMEN—I am not as well prepared for the presentation of this subject as I should be, and therefore sincerely regret that some other person of more extended experience in pruning the peach was not selected to take the impor-

tant part assigned to me. My embarrassment is no little increased by the fact that in maintaining my notions on this subject I am compelled to put myself in opposition to my very intelligent friend, Mr. Dyckman, one of Michigan's most distinguished pomologists, and the honored ex-President of this Society.

THE WAYS OF NATURE.

I do not "discard the shortening-in system," as does Mr. Dyckman. I cannot accept his belief "that Nature knows where to place the termination of a limb better than we do."

The best results in pomology are not attained by allowing nature to have her own way. If mere quantity of fruit only was desired, the vine-dresser might lay aside his pruning shears and abandon his trellis and posts; the small-fruit culturist could cease his efforts to grow stocky canes of raspberries and blackberries, with strong, low-running laterals, capable of winter protection. No doubt a grape vine that has gained sunlight in the top branches of an elm or oak will yield more pounds of grapes than the one compelled to confine its growth to four-feet arms; but the fruit of the one will be in small, ragged bunches; the other will be in large, compact clusters, salable at a more remunerative price.

NATURE,

if left alone, will exert herself for reproductive purposes, but the pomologist seeks to compel her to do more than this, and the success of his art is as marked within the sphere of his operations as are the effects of that discipline which contrasts mind educated in enlightened nations with mind uneducated in savage nature!

THE TWO METHODS.

I know of but two ways for pruning the peach, of a practical character. The one is that adopted by a majority of the growers in the Michigan Peach Belt, and expounded by Mr. Dyckman, consisting of a "mere annual thinning of the branches to keep the tree in proper form." The other is the shortening in system advocated by Mr. Downing, which consists in "cutting off half of last year's growth over the whole outside of the head of the tree, and also upon the inner branches." This system did not originate with Mr. Downing. It had been practiced for a hundred years or more in Europe before it received the sanction of his own strong judgment.

THE SHORTENING IN SYSTEM.

Of this system Mr. Downing says: "As the usual average growth is from one to two feet, we shall necessarily take off from six to twelve inches. It need not be done with precise measurement. Indeed, the strongest shoots should be shortened back most in order to bring up the others, and any long or projecting limbs that destroy the balance of the head should be cut back to a uniform length: this brings the tree into a well rounded shape. By reducing the young wood one-half we at the same moment reduce the coming crop one-half in number. The remaining half, receiving all the sustenance of the tree, are of double size. The young shoots which start out abundantly from every part of the tree keep it well supplied with bearing wood for the next year, while the greater luxuriance and size of the foliage, as a necessary consequence, produces larger and higher-flavored fruit."

Mr. Downing further advocates this system as a means of extending the life

of a peach tree, and cites the fact that trees treated in this way in France have lived a hundred years.

On this same subject Mr. Thomas says: "No tree requires continued pruning so much as the peach. There is a strong tendency in the terminal buds to push upward and outward at the expense of their sister shoots, which, soon dying, the tree ultimately is composed of long bare poles with only tufts of leaves at their extremities. It is well known that young trees bear large, handsome, and excellent fruit, while the old enfeebled trees yield nothing but small specimens of inferior quality. Continual pruning will prevent this bad result and preserve the heads of old trees in a state of thrifty growth, and they will continue to yield as large and fine fruit as in the first years of bearing. As the peach always bears its fruits on the previous year's growth, and buds never start from old wood, it is important to keep a continual supply of young wood evenly distributed throughout the head. This can only be done by continual cutting back."

In his interesting work on "Peach Culture" Mr. Fulton says concerning this shortening-in system, "There is still another advantage claimed for cutting in, and which we do not wish to undervalue. It is, that it invigorates and prolongs the life of the tree. We think this is so, and that a tree cut in annually will remain longer thrifty than one not so treated. The leaves will be greener, the young bearing wood more abundant, and the fruit larger and richer."

In passing, however, it is but fair to say that this author rejects this treatment of the peach, because he thinks it will not pay.

THIS SHORTENING IN

is advocated by the standard authorities in pomology for these reasons:

That it preserves a beautiful and well rounded head;

That it prolongs the life of the tree;

That it insures fruit of better size and flavor;

That it obtains bearing wood in abundance, properly distributed throughout the tree;

That it lessens the labor of thinning the fruit, and,

That it secures healthier and more luxuriant foliage.

THE STYLE OF PRUNING

befriended by Mr. Dyckman amounts to but little more than an aid to nature in denuding the tree of its side shoots, and in converting the shapely and symmetrical figure of vigorous youth into a green-tufted skeleton, but a step removed from premature death.

A tree thus stripped, with its trunk, crotch, and long limbs exposed to the sun and wind, is an object that excites my pity rather than my admiration.

The objection is urged against the shortening-in system, that it requires too much labor to pay. I do not believe it. If it requires twice the labor demanded by the thinning-out mode, and prolongs the life and vigor of the tree even fifteen years, it will pay in the long run, especially when we consider that it will lessen the cost of thinning.

In this connection I desire to offer for consideration a letter from Mr. C. Engle, of Paw Paw, one of the most experienced and successful peach growers in the State, a pomologist whose fruit is a favorite with buyers in any market where known, and whose orchard received the first premium of this society in

1874, that was awarded by a highly intelligent committee, after a careful inspection of competing orchards in different parts of the State, which had been treated mainly by the thinning-out mode maintained by Mr. Dyckman. Mr. Engle says:

LETTER FROM C. ENGLE.

PAW PAW, Jan. 1st, 1875.

DEAR SIR—I commenced the shortening-in system of pruning the peach when the trees were six years old and by trying a few trees the first season. The result was so very satisfactory, the trees so pruned yielding nearly as much in quantity and the fruit of double and some treble the size, that I went over nearly the whole orchard the following season. A few trees have been left without pruning until the present, for the sake of experiment; although, after two years' experience, there was no doubt in my mind about its beneficial effects. The benefits accruing are treble: first, an increased market value of the fruit; second, a more handsome, vigorous, and healthy tree; and third, a great saving of labor and time in thinning the fruit. We all know what an unsightly object an old peach tree becomes when left to itself. A few long, lean, skeleton branches, with nearly all the foliage and fruit at the extreme ends will correctly describe them. All this can be remedied, and handsome, round, compact head, well filled with foliage and fruit throughout by the simple process of shortening in. I usually choose mild weather in the late fall or winter in which to perform the work. Early spring is just as good a time, only our duties are more pressing then, and if put off until that time is very apt to be neglected. I have come to consider it an absolute necessity, the most so of any work performed in cultivating the peach. Occasionally, I have found it of great advantage to cut back some of the longer branches to where they are an inch to an inch and one-half in diameter, but usually it is only necessary to shorten the new growth from one-half to two-thirds, shortening the longer growths the most. My trees so treated exhibit all the beauty and vigor of form and growth at twelve years of age usually seen in trees of four and five years. When the season for thinning the fruit arrives, I find it takes only about one-third the time to do it. This of itself would pay if there were no other benefits, as at that time we are drove with all kinds of work, and are apt to neglect, or, at best, slight this very necessary labor. For I hold, that no man who raises peaches for market can afford to let his trees mature a great mass of small, inferior fruit, which will bring next to nothing, when, by judicious thinning, he can get the highest market price. On my younger orchards I have commenced cutting back at four years from setting, but shortening only the leading shoots the first season.

From the six years' experience on my older orchard, I believe the life of the peach can be prolonged to a much greater age than is usually attained by a severe, yearly shortening in.

Yours truly,

C. ENGLE.

It is urged also, by others than Mr. Dyckman, that this mode of pruning is not adapted to trees grown upon the light soil of the peach belt. If the soil is not rich enough to make a sufficient annual growth to sustain this shortening in, it should be enriched; and if that is impossible, then in such localities peach-growing will also soon be found both unprofitable and impossible. Mr. Dyckman depends upon "the natural tendency of the tree to grow stocky, with the annual thinning of the branches to keep it in proper form."

Of the varieties adapted to Michigan, the Hales and Crawfords particularly have a somewhat stocky habit, and these varieties would probably need less shortening in; but in view of the well known nature of the peach never to start buds from old wood, and the tendency of its terminal buds to push upward and outward at the expense of the side shoots, I am at a loss to understand how a round and symmetrical head is to be maintained by thinning out branches. And if a stocky habit of growth is to be depended on, this treatment will not apply to trees with long, drooping growth, like the Barnard, the Hill's Chili, and the Jacques Rarerie, the varieties that to-day furnish the strongest hope for the future of peach-growing in Michigan.

HEIGHT OF HEAD.

A paper upon this subject is not complete without a brief reference at least

to the height of head. I prefer a tree headed low, say twelve inches from the ground. I would shorten it in annually from the fourth year. Keep it within the reach of an ordinary-sized man from the top of a four foot step ladder, and plant them a rod apart, believing that 160 such trees to an acre shortened in annually will yield more fruit than fewer trees a greater distance apart with wide spreading heads supported on long bare arms.

I know it is said low-headed trees cannot be cultivated closely. I would plow and cultivate as close to the tree as I could without injury, and I believe that will be close enough for the health of the roots. The uncultivated ground should be hoed enough merely to keep it free from weeds and grass. The shade of the tree and the fallen leaves would preserve the moisture and keep the soil mellow. I am particularly in favor of low-headed trees, because I believe they are the healthiest. The most vulnerable part of a peach tree is from the collar to the head. If that head does not commence at the crotch, but several feet further up, a number of bare branches, it is all the worse, as this but multiplies exposed trunks. If the branches are enveloped in healthy foliage, and the crotch and short trunk are protected from the sun by an impenetrable shade, I believe the healthy action of the bark and sap will be uninterrupted.

WHEN TO SHORTEN IN.

I would not recommend that peach trees be shortened in in winter time, as laid down by Mr. Downing. If they should be exposed to severe cold shortly after being cut, as they would be liable to in our climate, they would be more likely to be injured. Mr. Engle says late fall or winter is the time. I should say early spring or early fall. Were it not for the harvest I would prefer about the first of September. The effect then would be the same as summer pruning on the grape: it would cause a better ripening of the wood.

Before concluding, I desire to recall some peculiarities of the peach tree that should not be forgotten in considering how it should be pruned.

PECULIARITIES OF THE PEACH TREE.

It is of rapid growth; it is not unusual for a young tree to make a growth of four feet in a single season. Cutting off branches does not paralyze the action of its roots; the whole top may be cut away and a new top will be pushed out with remarkable luxuriance and health. It is almost as tractable as a vine; in cold climates it has been successfully fruited by being trained on the ground where it could receive winter protection; in other countries, where the heat of summer is not sufficient to ripen its fruit, it has been trained against walls and upon trellises; it has been dwarfed merely by severe pruning, and fruited in pots under glass.

The importance of this subject cannot be over-estimated in this happily situated peninsula, where this rare and splendid product must ever be one of the rich rewards of the horticulturist. The proper mode of pruning should take rank among the first questions with cultivators of the peach.

ORGANIZATION AMONG FARMERS.

AN ADDRESS DELIVERED BY HON. R. E. TROWBRIDGE AT THE LANSING MEETING.

I have been invited to occupy a few minutes of your time in speaking of the "Need of Organization Among Farmers." If it were possible for me to bring vividly before your minds the extent and beauty, and even magnificence of the exhibition which surrounds us, comparing it with the earlier exhibitions of this society, and then with precision point out the instances and methods in which those who are contributors to this display have been benefited by those earlier exhibitions, and the very extensive discussions and comparisons of views which have attended them, thus enabling them to make this the most splendid display ever had of the fruits of our justly celebrated fruit State, I should feel that I had thus, perhaps, most completely illustrated the *advantages* of organization among one class of farmers.

But why may not equally valuable results follow the more extensive organization of farmers as a whole body? How have these results been achieved? By bringing together those engaged in kindred occupations and pursuits, where, by a comparison of views and methods, with the actual results or products on hand to show their superiority or inferiority, a spirit of friendly emulation and desire to excel has been engendered, while at the same time each and every one of these competitors has, with rare magnanimity, been willing to unfold to his fellow laborers those secrets by means of which he has been enabled to achieve whatever excellence he has reached.

The farmer must necessarily be, to a very great extent, isolated from his fellow men, and as a rule, farmers as a class are not men of wealth. Indeed, in most cases it requires the most rigid economy to enable them out of their annual products to feed, clothe, and properly educate their families. Many things which by other classes of society are regarded as almost necessities of life are to the farmer rarest luxuries. I do not say that the families of farmers do not enjoy as every-day blessings some things which many other people obtain only at great cost and look upon as rare enjoyments. Still, we undoubtedly find among farmers less disposition to provide themselves and their families with those enjoyments which we term intellectual,—books, periodicals, newspapers, and lectures, which have come to be looked upon by other classes, as a necessity of their daily existence, than characterizes almost any other class of people.

This fact, in connection with the one of isolation before spoken of, exposes them to the danger of standing still while the world around them is all in

motion. Here, then, I point to the first and most obvious advantage of organization to the farmer. By it the isolation of his life is broken into. Under the rules of his club, or grange, or society, whatever you may call it, once a week or once a month he, with his whole family, is drawn away from the solitude of his daily home life and thrown into friendly contact and intercourse with his fellows engaged in the same pursuits as himself, each and all of whom have come there with the same purpose, viz.: To learn something of value, and to impart something of value, and at the same time have a downright good social time. In this way information will be obtained and imparted which may be of very great advantage, and friendships formed whose effects upon the lives and characters of those concerned are absolutely incalculable.

Let me illustrate this. About two years ago I moved into this neighborhood, and for a year and a half I made no acquaintance except such as I made in my business transactions. My wife and family had previously lived in the neighborhood where they were born, and consequently knew and were known by every person in the neighborhood. Here during this year and a half they were called upon by but two ladies of the neighborhood, one of whom was the respected wife of the gentleman who has just addressed you, and it was becoming to my family quite lonesome. At the end of this year and a half I went with my wife to attend a pic-nic festival of the organization called grangers, which was celebrated a few miles from where we live. There we were met by brothers whose life pursuits, whose interests, associations, and aspirations were identical with ours, and my wife was introduced to their wives, and we began to feel that we had not emigrated beyond the pale of civilization. We had a downright good time. We joined their organization, and to-day I think I may safely say that Mrs. Trowbridge has made the acquaintance of at least a hundred ladies in the region round about, many of whom, I doubt not, will become valuable and cherished friends for life. Thus we see that organization among farmers answers to and fills up one of the greatest needs of our nature, by calling out, cultivating, and elevating our social character.

This sort of systematized, regulated intercourse of thinking, practical men and women cannot but have an elevating and improving influence upon the whole. It must always happen in any community that some men and women, by their sharper wit or superior advantages, will have acquired better methods of culture and better ways of doing things generally, than some, perhaps most of their less fortunate neighbors. It should be the ruling spirit of such an organization that these should ever be ready to impart their better methods to their fellow laborers, thus advancing the general prosperity and elevating the character of the community in which they live. It is certainly no unworthy ambition for any man to desire to be able to say "the communities in which I have lived are the better for my having lived in them."

But in a financial or business point of view very great advantage may be derived from a thorough systematic organization. It is right and proper that farmers, who are the producers of the food and clothing for the world, should receive for their products their full real value. But how shall they obtain the necessary information which shall enable them to do this? No single farmer can afford to collect the statistics of production and supply or scarcity of any one crop, which will enable him to intelligently decide when or where or at what price to sell his product. What, then, shall he do? What has he heretofore done? He has depended upon the statistics and information furnished to him by parties whose interest and intention were to deceive and mislead him,

in order to induce him to sell at a time and place when and where they could profit by his ignorance. I can now recollect two or three occasions when the farmers of Michigan, simply from lack of intelligence as to the wheat crop of a single year, have sold almost their entire crop for less than half what it would have brought them two months later in the same season, thus losing millions of dollars. How easy, by a systematic organization in which an almost infinitesimal assessment on each would have secured and disseminated correct information among them, to have saved this loss.

But this organization, to be most effective, should not be confined to Michigan or any one locality, but should at least be co-extensive with the whole United States. Then, by a system of reports from the subordinate organizations up to the national one, where they should be prepared, condensed, tabulated, and redistributed back to the subordinates, complete and accurate statistics can be placed in the hands of producers, from which they might with some degree of intelligence decide when and where they shall dispose of their products. Further, this national organization could, with regard to those articles of production which have to compete in the markets of the world, obtain for the whole country this same information in regard to the production in all the principal competing countries of the world, and with the same machinery place it in the hands of all the subordinate organizations interested in each production, thus still further enabling the producer to decide when and where to sell his products. Thus, as the result of systematic organization, we will have secured to each and every producer of the land information which no single man, however wealthy, would be able to obtain.

It would also be the duty of such an organization to inculcate and instill into the minds of its members the best methods of doing business. For example, there is no question that it is far better for every farmer to pay down at the time of purchase for whatever he gets. He will thus be enabled to claim from the dealer a fair reduction in price. For he thus not only enables him to buy for cash, and thus reinvest his money at once and over and over again, but also saves him from liability of loss from bad debts. Now, then, if thirty or forty families in a neighborhood will organize themselves together and agree with each other to trade for cash and at the same time concentrate their trade upon one particular dealer in a town like this,—still further, if ten or fifteen such organizations surrounding such a place will thus concentrate their trade, the dealer thus selected could certainly afford to deal with them upon a percentage of profit which would be absolute ruin under the present slipshod trade, trust and dicker system of business. As a further example, it is unquestionable for the interest of every producer to encourage and in every way sustain manufacturers, especially of such articles as he is obliged to use in his immediate vicinity. Especially is this true if he is the producer of the raw material out of which the article is produced; for he thus saves the cost of transportation of the raw material to the place of manufacture, and of the manufactured article back, and more he secures without cost of transportation, a market for other productions which the manufacturer consumes while employed in making the article.

For instance, it is the interest of farmers of Michigan in every way to encourage and sustain the manufacturer of woollen goods within this State. We produce an abundance of the very best wool, and also the wheat, the pork, the beef, the potatoes, and all the other provisions upon which the manufacturer must live while making the wool into cloth. Why then shall we transport all

these things at great expense a thousand or two miles away, to be worked together into cloth, when it could be done exactly as well right here among us as anywhere else? If an individual farmer were to load all these things into his wagon, and at great labor and expense draw them even 200 or 300 miles, there to combine them into cloth and then load the cloth into his wagon and draw it home again, when he could just as well have made the combination on his own farm, we should certainly all cry out "What folly!" But is not this just what we do when we pay transportation companies for carrying our wool, wheat, pork, beef, potatoes, etc., to New England, to be there put through the various processes by which they are converted into cloth, and then pay them for transporting the cloth back again to us, to be worn perhaps on the very farm where the materials out of which it was made, or some of them, were produced? But even this does not make the full statement of the case. For our wool, before it can be used in the manufacture of cloth, has to be cleansed, by which nearly one-half its weight is carried off in waste, so that we have to transport nearly two pounds of stuff to get one pound of real wool, and we have to transport sixty pounds of wheat to get forty of flour, which is the real article wanted, and in many cases instead of sending the pork, beef, and mutton, we send the animals *in a lean condition* and follow them up with the corn *and sometimes even the hay* by which they are converted into pork, beef, and mutton. How much better for us to reduce these articles at home as nearly as possible to the condition in which they are required for consumption in the markets of the world, and thus save the cost of transporting so great an amount of useless matter.

I have lately seen a statement that the ten States north of the Ohio river, commonly known as the Northwestern States, produced for export in 1873 somewhat over one hundred and twenty-five millions of bushels of wheat. Part of this wheat was exported in the crude state of wheat, and part after it had been manufactured into flour. If it had all been thus manufactured and sold at the rates prevailing in Chicago in November and December of that year, it would have brought one hundred and eighty-seven and one-half millions of dollars. Whereas, if it had all been sold as wheat at the rates prevailing at the same place and time, it would have brought only one hundred and forty-three and three-fourths millions of dollars, showing a difference in favor of the manufactured article of almost forty-four millions of dollars. Further, at the then prevailing rates of freight the flour could have been put in Eastern ports for twenty-seven millions of dollars, while the freight on the wheat would have been nearly forty-two millions of dollars, thus showing to those ten States a saving on a single crop of nearly sixty millions of dollars, by simply reducing their product to the state in which it is needed for consumption. And that, too, without taking into account the million and a quarter tons of valuable feed saved in the process, which may be fairly estimated to be worth ten millions of dollars more, thus making the saving to the Northwest, in one single year, on one of its great products, seventy millions of dollars. My time was limited for the reading of this paper.

But I have thus briefly, and, no doubt, with much imperfection, attempted to point out a few of the many great advantages which might accrue from a thorough and systematic organization among farmers, by means of which they might be brought together, and by the collection and dissemination of statistics and information, and by the thorough discussion and investigation of

principles, might be able to elucidate and mark out what would be for their true interests, and then, with full and entire confidence in each other, go forward in pursuit of those interests. Let no man tell me I have been describing an Utopian scheme, entirely impractical of application. I shall reply to him that such an organization exists, and to-day the monthly reports from 30,000 granges are on their way to the national headquarters, where they will be compared, condensed, and classified, and redistributed for the advantage and information of those who are fortunate enough to belong to the "Patrons of Husbandry."

OBSERVATIONS UPON THE PHENOMENA OF PLANT-LIFE.

BY PRESIDENT W. S. CLARK, OF THE MASSACHUSETTS AGRICULTURAL COLLEGE.

The observations concerning "The Circulation of Sap in Plants," which I had the honor of presenting before the Board of Agriculture at their last country meeting, were so kindly received at the time, and awakened so much interest after their publication, that I have found it impossible to refrain from further investigations upon the phenomena of plant-life. Among the subjects to which special attention has been directed during the year, the following may be enumerated, viz.:

First, The structure, composition and arrangement of the winter-buds of hardy trees and shrubs. Specimens for study were collected, in January and February last, from one hundred and forty species, and some facts of interest recorded.

Second, The percentage of water to be found in the branches and roots of trees during their annual period of repose, as well as when in active growth.

Third, The phenomena and causes of the flow of sap from wounds in trees when denuded of their foliage, as well as the flow from the stumps of woody and herbaceous plants when cut near the ground in summer. In connection with this subject, an attempt has been made to determine what species flow, how rapidly and copiously, and under what circumstances.

The pressure exerted by the sap exuded from detached roots of trees under ground, as well as that exhibited upon gauges placed at different elevations from the earth, has also been very carefully observed upon a number of species.

The facts determined are even more remarkable than were noticed last year, and are particularly important in the case of the sugar-maple.

Fourth, The structure and functions of the bark of exogenous trees, with special reference to the circulation of sap, the formation of wood and the effects of girdling,—concerning all which points many experiments have been undertaken with satisfactory results.

Fifth, An attempt has been made to measure the expansive force of growing vegetable tissue, and in connection with this experiment numerous other interesting observations have been reached.

These investigations have been instituted by myself; but in carrying them out I have enjoyed the valuable, and in many cases indispensable assistance of gentlemen connected with the agricultural college, either as officers or students. Due credit will be given to each in stating the results of his work.

QUALITIES FOR THE ORIGINAL INVESTIGATOR.

To succeed as an original investigator in science one must possess some of the noblest qualities of mind and heart. He must be absolutely and accurately honest, and in his methods of demonstration there must be no guess-work. He has need of a patience which is inexhaustible, a zeal and energy which never flag, and a spirit of devotion to his work which utterly ignores self as separated from the object to be accomplished. He must also have a well-disciplined mind, and skill in the use of books and apparatus. To produce such men, who shall at the same time be familiar with all the great principles and problems of agriculture, is the highest possible achievement of our college. One such graduate will do more for the advancement of the art, and the honor of the profession and the benefit of mankind, than would a host of mere farm apprentices possessed only of manual skill and a knowledge of simple, routine practice, however well adapted to any particular locality or style of farming.

I am well aware that there are persons who hold a respectable position in society, and yet are so ignorant as to regard with contempt all efforts at scientific research. They ridicule the attachment of gauges to trees, and the harnessing of squashes, and the microscopic and chemical analysis of plants as of no earthly use, except, perhaps, to gratify an idle curiosity. But how shall agriculture be improved without the application to it of the principles of science; and how shall these be applied unless they are discovered; and how shall they be known if they are not sought? In no way can the wealth of the world be increased so surely as by the liberal endowment of institutions for the special purpose of securing experiments in all departments of science which have a direct connection with agriculture, especially in chemistry and in animal and vegetable philosophy. When we consider that to observe the transit of Venus during the present month expeditions have been sent to different parts of the earth at a cost of more than a million of dollars, we may, at least, hope that scientific observations upon things nearer home, and having more to do with every-day life, will soon be appreciated and supported.

We are told that when the illustrious scientist, Faraday, who devoted his life to original research, was asked by some practical individual what was the use of one of his famous discoveries, he answered him by propounding another equally pertinent question, namely, "What is the use of a baby?" The possible results are in both cases of transcendent moment, but in neither can they be foretold. It is enough to know that every new truth is an open door to some further discovery and to some useful invention.

It has been well said that it is comparatively easy to know something about everything, but very difficult to learn everything about anything. Remembering that we are enveloped by inexplicable mysteries, and that abundant material for investigation lies everywhere about us, we have attempted to study that most familiar plant, *the squash*,—and the results have far surpassed our most sanguine expectations.

THE SQUASH.

The particular species selected for observation is named *Cucurbita maxima*, and the variety is called, by Gregory, the mammoth yellow Chili. It is said to be a native of the Levant, and to have been introduced into England in 1547. It is sometimes called the French pumpkin, and its fruit readily attains

a weight of one hundred and fifty pounds. One has been grown in England which weighed two hundred and forty-six pounds.

Squashes indigenous to tropical America were cultivated by the Indians long before the occupation of this continent by the whites.

THE CUCURBITACEÆ

are a small, but very useful order of the vegetable kingdom, numbering about three hundred and fifty species, which are chiefly natives of warm regions. The most valuable species are the squash, the pumpkin, the cucumber, the water-melon, the musk-melon, and the gourd, of all which there are numerous varieties.

These plants are generally herbaceous, and trailing or climbing by means of tendrils. Their stems, leaf-stalks, tendrils, and fruits are often hollow, and their tissues very soft and succulent.

The flowers are usually large, and either yellow or white, and of two or three sorts on the same plant. The fruit is commonly a pepo, the structure of which is familiar to all.

The following considerations suggested the idea of experimenting with the mammoth squash :

First, It is a well-known fact that beans, acorns, and other seeds often lift comparatively heavy masses of earth in forcing their way up to the light in the process of germination.

Second, We have all heard how common mushrooms have displaced flagging stones, many years since, in Basingstoke, and, more recently, in Worcester, England. In the latter case, only a few weeks ago, a gentleman noticing that a stone in the walk near his residence had been disturbed, went for the police, under the impression that burglars were preparing some plot against him. Upon turning up the stone, which weighed eighty pounds, the rogues were discovered in the shape of three giant mushrooms.

Third, Bricks and stones are often displaced by the growth of the roots of shade trees in streets. Cellar and other walls are frequently injured in a similar way.

Fourth, There is a common belief that the growing roots of trees frequently rend asunder rocks on which they stand, by penetrating and expanding within their crevices.

Having never heard of any attempt to measure the expansive force of a growing plant, we determined to experiment in this direction.

We were surprised, last year, in testing the pressure exerted by the sap of various trees, to find that a black birch root, detached from the tree, was able to force water to the height of eighty-six feet. We were therefore somewhat prepared for an exhibition of considerable power, but the results of our trials have, nevertheless, been most astonishing.

At first we thought of trying the expansive force of some small, hard, green fruit, such as a hickory-nut or a pear, but the expansion was so slow, and the attachment of the fruit to the tree so fragile, that this idea was abandoned. The *squash*, growing on the ground with great rapidity and to an enormous size, seemed, on the whole, the best fruit for the experiment.

Accordingly, seeds having been obtained from Mr. J. J. H. Gregory of Marblehead, they were planted on the first of July in one of the propagating pits of the Durfee Plant-House, where the temperature and moisture could be easily controlled. A rich bed of compost from a spent hot-bed was prepared,

which was four feet wide, fifty feet long, and about six inches in depth. Here, under the fostering care of Prof. Maynard, the seeds germinated, the vine grew vigorously, and the squash lifted in a most satisfactory manner.

Never before has the development of a squash been observed more critically, or by a greater number of people. Many thousands of men, women, and children, from all classes of society and of various nationalities and from all quarters of the earth, visited it. Mr. D. P. Penhallow watched with it several days and nights, making hourly observations. Prof. H. W. Parker was moved to write a poem about it, and Prof. J. H. Seelye declared that he positively stood in awe of it.

VEGETABLE GROWTH.

consists in the development of the several parts of a plant, according to a definite, predetermined plan as regards the form, size, and other characteristics of each species. It results from the activity of a certain peculiar inherent force called life. Under the influence of this force, stimulated to action by heat and light, plants absorb, digest, and assimilate mineral matter, converting it into the various organic substances which enter into their composition. Examined under the microscope, all parts of plants are found to exist primarily of closed cells, cohering into masses of various forms, and containing protoplasm.

GROWTH

is caused by the increase of cells in number and in size. In a growing portion of a plant, as at the tip of the stem, the first formed cells are subdivided, and then the subdivisions enlarge to the normal size, and this process goes on while growth continues. All vegetable material is primarily formed in the leaves or green parts of ordinary plants, and, by a vital process of circulation, is transferred in a liquid form to its proper destination.

THE SEED

is a minute plant, consisting of a radical or little root, a terminal bud called the plumule, and one or more seed-leaves, all snugly packed away in a shell for safe keeping during transportation. In order that the sprouting plantlet may be able to get hold of the earth for its water and mineral supplies, and have substance enough to reach up into the light and air where it is to find its future carbon, the seed-leaves, or cotyledons, are formed of very condensed and complex materials,—such as oil, sugar, starch, and albuminoids. The requisite conditions of germination for a sound, living seed, are air, water, and a moderate degree of heat. The time intervening between the planting of a seed and the appearance of the root varies from a few hours to many months. It may be hastened in some cases by scalding the seed for a few minutes in hot water, or by the judicious use of a solution of camphor, sal-ammoniac, or oxalic acid. The cotyledons of the squash seed are pushed up into the air, where they expand and thicken, assume a green color, and for a time perform the functions of true leaves.

THE ROOT

is the first part of a plant to grow, and develops downward, as if affected by the force of gravity. Light neither hurts nor helps the root, but water is essential to its life, and for this it penetrates the soil in every direction. It is the special function of the root to absorb and furnish to the rest of the plant,

water, nitrogenous matter, and such soluble minerals as each species requires for its use. For this purpose it is admirably adapted by its peculiar structure, substance, and mode of increase. The older portion of roots serves to sustain the stem and hold it in place, and also acts as a reservoir of supplies to the plant. The younger roots usually branch off in an irregular manner, and elongate by the multiplication of cells near their extremities. The tips of roots are usually very minute fibres of exceedingly delicate tissue, which insinuate themselves into the pores of the soil, and then, by the expansive power of growth, enlarge these capillary channels to any required size.

ROOTS

of ordinary plants grow most freely in a loose, well-drained soil, containing the essential elements of plant-food in a soluble form. They absorb their water from the surface of the molecules of the soil, to which they attach themselves by very minute, cellular papillæ, called root-hairs. These hairs are much more numerous in a soil moderately dry than in one which is wet and heavy. The most vigorous plants have the largest number and greatest extent of roots. Hence the importance of deep and thorough tillage in preparing the ground for crops. The growth of a plant depends chiefly upon the amount of water which is exhaled by its leaves, and this necessarily depends upon the supply furnished by the roots. The folly of ploughing between rows of corn, or other plants, after their roots have spread widely through the soil, is self-evident. Prof. L. B. Arnold says he has known the maturing of a corn-crop postponed ten days by ploughing it at the last hoeing.

THE PENETRATING POWER AND TENDENCY OF ROOTS

is well illustrated in the case of an apple-tree on the College Farm, which forced its roots down through a mass of coarse gravel eight feet, to obtain a supply of water. The stones were about the size of hens' eggs, and so closely packed by the waters of the drift period which deposited them, that the cylindrical form of the roots was entirely destroyed. The growing tissues pressed themselves into every crevice so as actually to surround and enclose the adjoining pebbles. A similar root of an elm was recently dug up in Westfield, Mass., and presented to the College Museum by Mr. B. H. Averell. Prof. Stockbridge, last fall, washed out a root of common clover, one year old, growing in the alluvial soil near the Connecticut River, and found that it descended perpendicularly to the depth of eight feet. Mr. Meehi, of Tiptree Hall, England, tells us that the reason clover is usually so short-lived, is the fact that the lower roots are either unable to penetrate the subsoil or to find in it the requisite supplies of food. He also states that his neighbor, Mr. Dixon, of Riven Hall, dug a parsnip which measured thirteen feet six inches in length, but, unfortunately, was broken at that depth.

The roots of lucerne often penetrate to the depth of more than twenty feet, while the tap-roots of trees, continuing to grow for a long period, descend still further. A British officer in India reports that the root of a leguminous tree—the *Prosopis spicigera*—is often dug for economical purposes, and that he has seen an excavation sixty-nine feet deep made for such a root without reaching its lower extremity. The roots of trees are well known to extend in a horizontal direction to surprising distances, and to exert a very deleterious influence on crops in their vicinity. The living roots of an elm, in Amherst, were found in abundance at a distance of seventy-five feet from the trunk, which was just

the height of the tree. It has recently been stated in "The Field," an English paper, that the roots of an elm were found to obstruct a tile-drain which was four hundred and fifty feet from the tree.

FIFTEEN MILES OF ROOTS.

But our squash-vine affords the most astonishing demonstration of all that has been said about root-development. Growing under the most favorable circumstances, the roots attained a number and an aggregate length almost incredible. The primary root from the seed, after penetrating the earth about four inches, terminated abruptly and threw out adventitious branches in all directions. In order to obtain an accurate knowledge of their development, the entire bed occupied by them was saturated with water, and, after fifteen hours, numerous holes were bored through the plank-bottom, and the earth thus washed away.

After many hours of most patient labor, the entire system of roots was cleaned and spread out upon the floor of a large room, where they were carefully measured. The main branches extended from twelve to fifteen feet, and their total length, including branches, was more than two thousand feet. At every node, or joint, of the vine, was also produced a root. One of these nodal roots was washed out and found to be four feet long, and to have four hundred and eighty branches, averaging, with their branchlets, a length of thirty inches, making a total of more than twelve hundred feet. As there were seventy nodal roots, there must have been more than fifteen miles in length on the entire vine. There were certainly more than eighty thousand feet; and of these fifty thousand feet must have been produced at the rate of one thousand feet or more per day.

Now, it has been said, that corn may be heard to grow in a still, warm night; and it has been proved that a root of corn will elongate one inch in fifteen minutes. But here are twelve thousand inches of increase in twenty-four hours! What lively times in the soil, where such vital force is at work! The wonder is, we do not hear the building of these roots as it goes on.

But in addition to the movements caused by the increase of the roots among the particles of the soil, we should remember that solution, chemical affinity, diffusion and capillarity, as well as the absorption of the feeding rootlets, are incessantly at work beneath the surface of the silent earth. With what amazement should we behold the development of a crop upon a fertile field, if we could but see with our eyes the things which are known to transpire!

Let us next consider some peculiarities of plant-growth which were exhibited in the development of the squash-vine, with its appendicular organs,—the leaves and the tendrils,—and its reproductive organs,—the flowers and the fruit.

THE BUD.

The peculiar feature of the *vegetable stem* is the *bud*, by which it is always terminated, even in the seed. A *bud* is an aggregation of delicate cells, filled with protoplasm, and endowed with special vitality. Sometimes it is very minute and simple in structure, and sometimes large and complicated. As the stem elongates, it usually produces, at regular intervals, leaves, in the axils of which are formed buds, which in growing become the terminal buds of branches. The places where leaves are borne are called *nodes*, and the spaces on the stem between these are styled *internodes*. Every species of plant has a definite law

for the arrangement of its leaves. Our squash produced one leaf at each node, and all the leaves were arranged in two rows on opposite sides of the stem. The vital force in the tip of the vine was very active and vigorous, and displayed its power in the constant organization of new nodes. Thus, when we examined the terminal inch of the vine, we found no less than twenty-five young leaves, and in the axils of these twenty-five flowers, including five young squashes, twenty-five branching tendrils, and twenty-five buds for lateral branches. These were continually reproduced, so that when the vine was growing nine inches a day, as well as after it had developed one hundred nodes, the number was always about the same. All parts of the vine and its appendages increased with marked uniformity. Back of the first inch, which may be regarded as the terminal bud, about six nodes were developing at the same time. The growth was most rapid in the terminal portion of each node, and the leaves were not modified particularly in form during the period of development. The lengthening of the vine proceeded somewhat irregularly, varying from nothing to nine-sixteenths of an inch per hour. It was usually less between midnight and sunrise than at other hours.

THE LONGEST GROWTH

of the main vine in twenty-four hours was observed August 15 and 16, from 7 A. M. to 7 A. M., and amounted to nine inches. The laterals were removed when two or three feet in length. The total extent of the main vine was fifty-two feet, and the number of nodes was one hundred. At each node of the fully developed vine were found a large leaf; a long, branching tendril, resembling the veins of a leaf, without the intervening cellular tissue; a staminate flower on a long stalk, or a pistillate flower on a short stalk; a lateral branch, and, on the under side of the vine, a long, branching root. The function of this root was evidently to supply water to the leaf above it, and its development, of course, depended chiefly upon the nutrient material elaborated by this leaf. These nodal roots not only furnished a much larger feeding-ground for the plant, but saved an immense amount of mechanical work in reducing the distances through which the crude and elaborated saps must be carried.

THE LARGEST LEAVES

of the squash vine were nearly circular, and slightly lobed, with a diameter of two feet and a half, and a superficial area of about seven hundred square inches. The leaf-stalks were hollow, two feet in length, and curiously marked with vertical striæ, alternately light and dark in color. The light lines were found to contain bundles of fibro-vascular tissue, while the dark ones were simple cellular tissue, containing chlorophyl.

THE SPECIAL FUNCTIONS OF THE LEAF

are to absorb carbonic acid from the atmosphere, and, by a process of digestion, form from its carbon and the elements of water the soluble starch and sugar, out of which the tissues of the plant are constructed; to exhale the surplus water of the crude sap, and thus aid in its ascension from the soil and the roots; to exhale the oxygen set free in the process of digestion, and thus to purify the air for the respiration of animals; and finally to exhale, at night especially, the surplus carbonic acid liberated within the plant in the process of vegetable respiration, which appears to be as necessary and constant as that of animals. It seems, also, most probable that the albuminoids, or protoplas-

mic substances, are first produced in the leaf, and thence transferred to the various localities, where they are needed in the process of growth.

THE LEAF.

To facilitate and control the absorption and exhalation of gases and aqueous vapor, leaves are furnished with breathing-pores or stomates, which open under the stimulus of light and moisture, and close in darkness, or when scantily supplied with water. These stomates are about twice as numerous on the under as on the upper side of the squash-leaf, and the total number is about one hundred and fifty thousand to the square inch, or more than one hundred millions on each large leaf. One leaf of the great water lily, *Victoria regia*, nine feet in diameter, contains about twenty-four hundred millions of stomates on its upper side, and none on its under surface, where they would be useless.

CARNIVOROUS PLANTS.

During the past year much has been written and said about carnivorous plants, which catch great numbers of insects for the apparent purpose of feeding upon them. When a fly alights on the leaf of a *Dionaea*, the two halves close upon it and hold it fast until consumed, when they open for another. The leaf of a species of *Drosera*, in New Jersey, is said to have the power of moving towards an insect, fastened within half an inch of it, and feeding upon it. The pitcher-shaped leaves of *Sarracenia variolaris* not only seems to possess the power of enticing insects to climb from the ground to the inside of their pitchers, by secreting a vertical line of honey on the outside, and also a line around the edge of the cup, but they prevent their escape by an ingenious arrangement of hairs, which continually force them downward as they attempt to fly out. When they thus reach the bottom of their prison they come in contact with a fluid which first paralyzes them and then hastens their decay and absorption.

CLIMBING PLANTS.

Not less wonderful are the instinctive movements by which climbing plants seek for, and attach themselves to, a support. Twining vines, like the hop, the bean, and the morning-glory, exhibit a revolving movement of their extremities, until they come in contact with some object around which to coil. Each species has its own peculiar direction, from which most of them never vary. A few, like the hop, wind from the right upward, towards the left, moving like the hands of a watch, but most, like the bean, move in an opposite direction. The squash, however, is not a twining plant, but climbs by means of tendrils. Nevertheless, the tip of a growing vine revolves continually from left over to right, in evident search for a support.

INSTINCT OF PLANTS.

Mr. J. J. H. Gregory informs us that if a shingle be set into the ground near the tip of a growing squash-vine, it will, in a day or two be seen turning towards it; and that, if the shingle be removed to the opposite side, the direction of the vine will again be changed. He also states that he has observed a squash-vine, after running along on the ground ten or twelve feet, and then passing under the branches of a tree which were four feet above it, to stop and turn upward towards the branches. After growing in this direction till it could no longer sustain itself, the vine fell to the ground; but instead of proceeding horizontally, it again rose into the air, again to fail. A third effort was made before the plant was willing to give up and trail humbly on the earth.

The end of the vine under observation was constantly elevated to the sash-

bars and glass above it, sometimes to the height of two feet, and as it increased in length, was pushed along against them. The extent and velocity of the terminal motion were doubtless greatest in August, when growth was most rapid. The record, however, was made in November. The time occupied in each revolution was variable, and the long diameter of the ellipse described, which was horizontal, measured about two inches.

THE TENDRILS

of the squash-vine were produced at the nodes, and the main stalk was hollow, and divided into several branches at a point three or four inches distant from the vine. These branches spread out in various directions, and attained a length of six or eight inches. Each branch gradually straightened out from the coil in which it first appeared, and increased in length. When about two-thirds developed it began to revolve so that its hooked tip described an ellipse several inches in diameter. Its revolution was made by a series of bendings, in such a way as not to twist itself. The tendrils moved in the same direction with the tip of the vine, but somewhat irregularly both as to time and to the figure described. During the day the ellipse was broad, and at night long and narrow. Usually the motion was scarcely perceptible to the eye, but sometimes it moved two inches in five minutes. The average time of revolution in November was about three hours. If touched by the finger on the sensitive or inner side, the tendril bent towards the place where the finger was, and, not finding it, straightened itself again. If, however, it came in contact with any object to which it could cling, it bent at the point of contact, and the concave curvature extended along the inside of the branch until the extremity was wound closely around the support. Other branches would, also, fasten to the same object, if possible. The tendril, thus attached, increased in size and firmness, and soon coiled upon itself in a double reversed spiral, so as to exert a strain on the support. All the branches having done this, they pull together and must fail together, if at all.

Another most obvious benefit derived from this double spiral is the elasticity of the fastening, which greatly diminishes the danger of rupture by violence. If the tendrils of the squash failed in finding a support, the branches then coiled upon themselves, and the main stalk often turned back along the vine.

THE HABITS

of climbing plants have been studied by Mr. Charles Darwin and others; but this field for research is by no means exhausted.

The tendrils of the grape-vine are not very sensitive, but fasten themselves very firmly to a suitable support. The tendrils of the *Cobæa scandens* are long, branching, and tipped with woody claws. They are extensions of the petiole of a compound leaf, revolve actively, and attach themselves in a most marvellous manner. When a revolving branch has found a support, it contracts so as to bring its extremities in contact with it. The other branches seek the same object, and as they are sensitive on all sides, they fail in many cases to secure a firm attachment with their claws. They therefore detach themselves from their support, one at a time in succession, twist so as to bring their claws into the proper direction, and then again make fast.

It is well known that most plants grow toward the strongest light; but climbing plants are sometimes exceptions. English ivy turns its young shoots away from the light in order that they may come in contact with dark objects,—such as rocks and trunks of trees,—to which they then attach themselves by short roots. The tendrils of the Virginia creeper, or woodbine, are among the

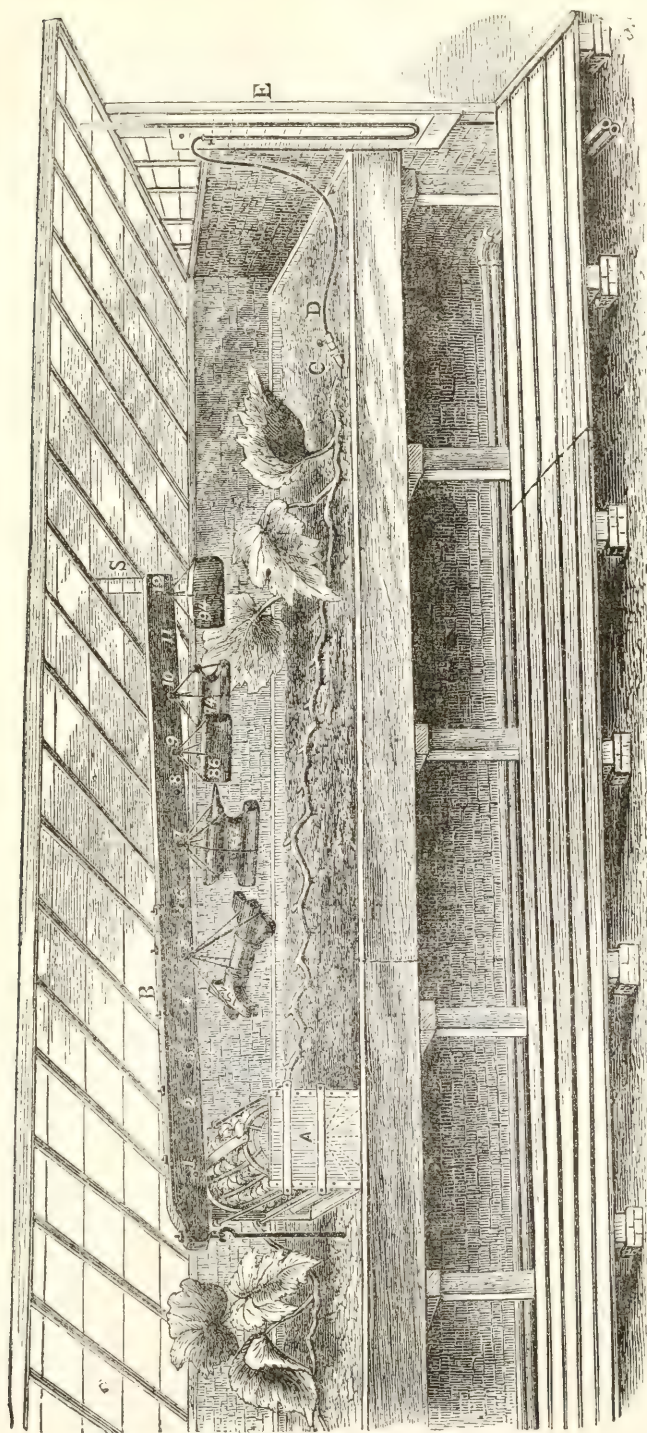
most wonderful. They grow away from the light, and send their branches into crevices of old bark and rocks. Sometimes such tendrils are said by Mr. Darwin to actually show a power of choosing one place of attachment in preference to another, by penetrating a cavity and then withdrawing to seek a more satisfactory one. As soon as the tendrils of the creeper find a support, the branches spread out their tips and press them against it. Little pads of hard cellular tissue are now developed at the points of contact, and the tendril coils on itself and becomes very tough and woody. At the end of the first season it dies, but remains firmly fixed to its support for many years. Mr. Darwin found one, which, though ten years old, was not detached by a weight of ten pounds from the wall to which it had adhered.

STRUCTURE OF SQUASH VINE.

The chemical constitution of the squash vine under observation has not yet been determined; but its anatomical structure, in all its parts, may be readily understood by an examination of the figures appended to this paper, which are accompanied by detailed explanations. The vine, the petioles, the flower-stalks, the tendrils and the fruit were hollow, so that about thirty per cent of the apparent size was simply air. The greater proportion of the remainder was water, so that less than ten per cent of the entire volume was solid, dry material. The large, yellow flowers were arranged in regular succession, one at each node. A female flower was usually succeeded by four males, so that on such a vine a squash would be produced at every fifth node, if every one should set,—which, however, never happens. The impregnation of the ovules within the ovary of the female flower requires the deposition of pollen-grains from the anther-cells of the male flower upon the stigma of the former under favorable circumstances. The stigmatic surface must be in a proper condition to retain and develop the pollen, which must be in a perfect state. Bright, warm weather will doubtless aid in the process, though many observations are still needed concerning this subject. The pollen-grains of the squash are large and rough, and of a spherical form, and consist of an outer and inner coating of membrane filled with a protoplasmic fluid. In the outer coating is a minute orifice, through which, when moistened by the saccharine secretion of the stigma, the inner coating protrudes as a microscopic, structureless tube, which pushes its way through the tissues of the style and ovary until it reaches the embryo-sac of an ovule, which may then become a perfect seed. This contact of the pollen-tubes with the ovules is essential to the setting of every squash. The transfer of the pollen-grains to the stigmas is usually accomplished by insects which fly from flower to flower in pursuit of food. It may, also, be done artificially, and there is reason to believe that the crop of squashes, melons and cucumbers might often be largely increased by attention to this matter in outdoor cultivation. When grown under glass, fertilization must always be effected by artificial means.

HARNESS FOR SQUASH.

The pistillate, or female flower, on the twenty-first node of the growing vine, was artificially impregnated with pollen from a staminate, or male flower, on the first of August. The young squash immediately began to enlarge, and, on the fifteenth of the same month, measured twenty-two inches in circumference; on the sixteenth, twenty-four inches, and on the seventeenth, twenty-seven. Though the rind of the young fruit was very soft, it was now determined to confine it in such a way as to test its expansive power. In doing this, great



THE AMHERST SQUASH IN HARNESS.

The above cut exhibits the propagating pit with the squash in harness, and the squash root of a second vine attached to a mercurial gauge to show the pressure of the sap. A, the box in which the squash was placed; B, the lever to support the weights; C, the root from which the principal vine grew; D, the root of the vine which was cut off when eight weeks old, and connected with a gauge; E, mercurial gauge; S, scale to indicate the variations in the position of the lever.

care was taken to preserve the health and soundness of every part of the squash, and to expose at least one-half of its surface to the air and the light. The apparatus for testing its growing force consisted of a frame, or bed, of seven-inch boards, one foot long. These were arranged in a radial manner, like the spokes of the lower half of a wheel, their inner edges being turned toward the central axis. These pieces were held firmly in place by two end-boards, twelve inches square, to the lower half of which they were secured by nails and iron rods. A hemi-ellipsoidal cavity, about five inches deep in the centre and eight inches long, was cut from the inner edges of the seven boards, and in this the squash was carefully deposited, the stem and vine being carefully protected by blocks of wood from injury by compression. Over the squash was placed a semi-cylindrical harness, or basket of strap iron, firmly riveted together. The meshes between the bands, which crossed each other at right-angles, were about one inch and a half square. The harness was twelve inches long and the same in width, so that when placed over the squash it just filled the space between the end-boards. Upon the top of the harness, and parallel with the axis of the cylinder and the squash, was fastened a bar of iron with a knife-edge to serve as the fulcrum of a lever to support the weights by which the expansive force was to be measured. At first, an iron bar, one inch square, was used for a lever, then a larger bar of steel, then a lever of chestnut plank, then one of seasoned white oak plank, and finally, one of chestnut, five by six inches square, and nine feet long; but even this required to be strengthened by a plate of iron four inches wide by half an inch thick and five feet in length. The fulcrum for the lever was also renewed from time to time as the weight was increased.

THE WEIGHT OF IRON.

The following table shows the weight of iron lifted by the squash in the course of its development:

August 21	-----	60 pounds.
" 22	-----	69 "
" 23	-----	91 "
" 24	-----	162 "
" 25	-----	225 "
" 26	-----	277 "
" 27	-----	356 "
" 31	-----	500 "
September 11	-----	1,100 "
" 13	-----	1,200 "
" 14	-----	1,300 "
" 15	-----	1,400 "
" 27	-----	1,700 "
" 30	-----	2,015 "
October 3	-----	2,115 "
" 12	-----	2,500 "
" 18	-----	3,120 "
" 24	-----	4,120 "
" 31	-----	5,000 "

The last weight was not clearly raised, though it was carried ten days, on account of the failure of the harness irons, which bent at the corners under the enormous pressure of two and a half tons, and consequently broke through the

rind of the squash. It was not feasible to remove the harness and substitute for it a stouter one, on account of its being imbedded in the substance of the squash, which grew up through the meshes of the harness, forming protuberances an inch and a half high and overlying the iron bands. When, on the seventh of November, the harness was removed in order to take a plaster cast of the squash, it was necessary to cut the straps with a cold-chisel, sometimes into several pieces, and draw them out endways.

The growing squash adapted itself to whatever space it could find as readily as if it had been a mass of caoutchouc; nor did it ever show the slightest tendency to crack, except in the epidermis. This would often open in minute seams, from which a turbid mucilaginous fluid exuded. In the morning, drops of this would frequently bedew the protuberances like drops of perspiration. In the sunshine these dried up and fell off as minute globules, resembling gum Arabic.

The lifting power was greatest after midnight, when the growth of the vine and the exhalation from the foliage was least.

The material out of which the squash was formed was elaborated in the leaves during the day-time, and transferred through the vine to the stem. Through this it was imbibed by the living, growing cells of the squash, which were constantly multiplying by subdivision until their number was many billions, notwithstanding the enormous pressure under which they were forced to develop. This growth was possible only because life is a molecular force and exerted its almost irresistible power over an immense surface of cell membrane.

Scarcely less astonishing than the mechanical force exhibited was the ability of the tissues of the squash to resist chemical changes and the attacks of mould, when the rind was injured by bruises or cuts. Whenever fresh-growing cells were exposed to the action of the air, they immediately began to form a regular periderm of cork, precisely similar in appearance and structure to that produced upon the cork-oak, the elm, and other trees.

The form of the squash can hardly be described, but may be seen in the drawings which show the upper and under sides. The weight was forty-seven pounds and a quarter, and when opened the rind was found to be about three inches thick and unusually hard and compact. The internal cavity corresponded in general form to the exterior, but was very small, and nearly filled with fibrous tissue and plump and apparently perfect seeds in about the normal number. A squash of the same variety, grown in the field by Messrs. Russell Brothers, in North Hadley, weighed one hundred and twenty-three pounds. Its form was ovoid, but flattened as if by its own weight, and the cavity within had a capacity of about sixteen quarts.

PRESSURE OF SQUASH SAP.

Two vines having been started together in our experimental bed, it was decided to apply a mercurial gauge (such as will be described in another place) to the neck of one cut off at the ground when the vine was about eight weeks old and had a length of twelve feet. The result was quite surprising, greatly surpassing anything heretofore recorded, so far as we are aware, concerning the pressure exerted by the sap of an herbaceous plant, the maximum force with which the root of the squash exuded the water absorbed by it being equal to a column of water 48.51 feet in height. The gauge was applied about noon, August 27. At 2 P. M., August 28, the temperature of the pit being 86° Fahrenheit, the pressure on the gauge equalled 31.70 feet of water.

At	4 P. M.,	Aug. 28,	it was	29.47	feet,	Temp.	75°	Fahrenheit.
"	9 P. M.,	" 28,	"	25.78	"	"	63°	"
"	1 A. M.,	" 29,	"	32.30	"	"	63°	"
"	2 P. M.,	" 29,	"	42.59	"	"	85°	"
"	9 P. M.,	" 29,	"	48.51	"	"	65°	"
"	8 A. M.,	" 30,	"	39.33	"	"	70°	"
"	12 M.,	" 30,	"	35.25	"	"	84°	"
"	7 A. M.,	" 31,	"	27.88	"	"	67°	"
"	8 A. M.,	Sept. 1,	"	00.00	"	"	00°	"

GAUGES

were also attached to the stumps of large plants of Indian corn, tobacco, and the dahlia. The results were not specially different from what has been previously observed by Hofmeister and others. The flow continued but a very few days, and the pressure varied from eight to twenty-five feet of water. The pressure in all these cases seems to be caused by the activity of the absorbent tissues of the root; and its cessation results, doubtless, from the stagnation of the sap in the gorged cells and vessels, and the consequent decay of the root-hairs and fibres.

The frequent displacement of flagging-stones, and the damage often done to brick and concrete pavements and stone walls by the roots of shade trees, considered in connection with the wonderful expansive power exhibited by the squash in harness, made it evident that growing roots of firm wood must be capable of exerting, under suitable conditions, a tremendous mechanical force. Upon searching the fields for examples of trees standing upon naked rocks, or ridges covered with only a shallow soil, many interesting specimens were readily discovered to demonstrate this fact.

LIFTING POWER OF ROOTS.

In South Hadley, Mass., a sugar maple was found which had grown upon a horizontal bed of red sandstone. The tree stood upon the naked rock, over which its roots extended a few feet in three directions into the soil. One root had pushed its way under a slab of rock which measured more than twenty-four cubic feet, and must have weighed about two tons. In the course of twenty years or more, this root had developed to such a size as to raise the slab entirely from the bed-rock and from the earth, and so that it rested wholly upon the wood. Upon examining the tree, it was evident that as it stood upon the horizontal roots which rested on solid rock and had a diameter of nearly a foot; and as they had grown by the deposition of an annual layer of wood entirely around them; and as the heart, now several inches from the rock, must once have rested on it; and as the rock could not have been depressed,—therefore, the tree had been lifted every year by the growing wood of the outside layer.

Another tree of paper birch having been found growing in a similar manner, one of the horizontal roots was sawed through, and the center of the heart was seen to have been elevated seven inches since the tree was a seedling.

Mr. William F. Flint, a student in the Agricultural College of New Hampshire, has rendered valuable assistance in finding specimens of trees which illustrate this principle in an admirable manner.

Now, it is clearly demonstrated that the power of vegetable growth can lift a tree, and that it must do so, whenever the bed of the roots cannot be de-

pressed. It is evident also that old trees on a clay hard-pan or any other unyielding subsoil must be thrown up by the process of growth. Every person is familiar with the fact that large trees usually have the appearance of having been thus raised, and their roots are often bare for a considerable distance around the trunk.

This lifting of the tree from its bed would seem to be advantageous to it by tightening the roots so as to hold it firmly in place, notwithstanding the possible elongation of their woody fibre by the tremendous strains to which they are subjected during violent storms. This method of securing the tree in place would be still further improved by the constant enlargement of the roots by the annual deposition of a layer of wood, and the consequent filling of any spaces formed in the soil by the movements of the roots, caused by the swaying of the tree in the wind.

This slight annual elevation of trees by the increase in diameter of their horizontal roots furnishes an explanation for the differences of opinion in regard to the question whether a given point on the trunk of a tree is raised in the process of its growth. While it has been demonstrated by Prof. Asa Gray that two points in a vertical line on the trunk of a tree will not separate as it enlarges, it seems equally clear that both of them may be quite perceptibly elevated in the course of time.

It has been stated on good authority that, at Walton Hall, in England, a mill-stone was to be seen, in 1863, in the center of which was growing a filbert tree, which had completely filled the hole in the stone, and actually raised it from the ground. The tree was said to have been produced from a nut, which was known to have germinated in 1812. The above story has been declared false, because, as asserted, the tree could not have exerted any lifting power upon the stone. It is, however, not difficult to see that it may be true, and is even probable.

Yet it should be remembered that the amount of elevation, in any case where it occurs from the increase in the size of horizontal roots, must depend upon the firmness of the material on which they rest, and can never exceed one-half the diameter of the largest roots. When, therefore, a writer, as has happened, asserts that, during a visit to Washington Irving at Sunnyside, he carved his name upon the bark of a tree beneath which he was sitting in conversation with the illustrious author, and that many years after he went to the place, and with much difficulty discovered the identical inscription, high up among the branches, far above his reach, it is altogether probable that his feelings were too many and too exalted for the ordinary use of his intellectual faculties.

DR. PETTIGREW'S HYPOTHESES EXPLODED.

Since the publication of the paper on the "Circulation of the Sap in Plants," in the last volume of the *Agriculture of Massachusetts*, a course of lectures on the "Physiology of the Circulation in Plants, in the Lower Animals, and in Man," by Dr. J. Bell Pettigrew, has been published by Macmillan & Co., of London. The hypotheses adopted by this author are quite extraordinary, and evidently announced without the slightest attempt at demonstration, although he has invented a new method of accounting for the phenomena of the motions of the sap. Thus he says, "In trees the sap flows steadily upward in spring, and steadily downward in autumn." Also, "Much more sap is taken up than is given off in spring, in order to administer to the growth of the

plant. In autumn, when the period of growth is over, this process is reversed, more sap being given off by the roots than is taken up by them." Now, this is pure assumption, there being no proof that the sap of trees escapes from the roots in autumn. In fact, it appears that the wood of trees contains as much sap in winter, when at rest, as in the period of most active growth.

Again, Dr. Pettigrew remarks: "It is difficult to understand how excess of moisture in the ground can be drawn up into the plant and exhaled by the leaves at one period, and excess of moisture in the atmosphere seized by the plant and discharged by the roots at another. The explanation, however, is obvious, if we call to our aid the forces of endosmose and exosmose. The tree is always full of tenacious, dense saps, and it is a matter of indifference whether a thinner watery fluid be presented to its roots or its leaves; if the thinner fluid be presented to its roots, then the endosmotic or principal current sets rapidly in an upward direction; if, on the other hand, the thinner fluid be presented to the leaves, the endosmotic or principal current sets rapidly in a downward direction."

This explanation is not only false, but superfluous, since no such circulation can be shown to exist, but is an excellent sample of the common mode of dealing with this obscure subject. Instead of seeking to discover the exact facts concerning the composition and movements of the sap in all parts of the plant, a display of book-knowledge is made by quoting from numerous writers of some repute, such statements as seem to corroborate the hypotheses of the author. The assumed phenomena of the circulation are then accounted for in an apparently scientific manner by ingenious allusions to osmose, capillarity, and other physical forces, the surprising possibilities of which are duly recounted.

Dr. Pettigrew further observes, that "Herbert Spencer believes that the upward and downward circulation of crude and elaborated saps takes place in a single system of vessels or vertical tubes." To explain this extraordinary assumption, Mr. Spencer states that "the vessels of the branches terminate in club-shaped expansions in the leaves, which expansions act as absorbent organs, and may be compared to the spongioles of the root. If, therefore, the spongioles of the root send up the crude sap, it is not difficult to understand how these spongioles of the leaf send down the elaborated sap, one channel sufficing for the transit of both." This hypothesis concerning the circulation of sap is accepted only by its inventor, and is directly opposed to most of the facts of plant growth.

Finally, Mr. Pettigrew has conceived a system of syphons by the aid of which he is able to account to his entire satisfaction for all he knows concerning the circulation of sap. He says: "The vessels which convey the sap, as is well known, are arranged in more or less parallel vertical lines. If the vessels are united to each other by a capillary plexus, or, what is equivalent thereto, in the leaves and roots, they are at once, as has been shown, converted into syphon tubes, one set bending upon itself in the leaves, the other set bending upon itself in the roots. As, however, a certain portion of the syphon tubes which bend upon themselves in the roots are porous and virtually open towards the leaves, while a certain portion of the syphon tubes which bend upon themselves in the leaves are porous and virtually open towards the roots, it follows that the contents of the syphon tubes may be made to move by an increase or decrease of moisture, heat, etc., either from above or from below. In spring the vessels may be said to consist of one set, because at this period

the leaves and the connecting plexuses which they contain do not exist. All the vessels at this period may, therefore, be regarded as carrying sap in an upward direction to form shoots, buds, and leaves, part of the sap escaping laterally, because of the porosity of the vessels. In summer, when the leaves are fully formed, the connecting links are supplied by the capillary vascular expansions formed in them,—the tubes are in fact converted into syphons. As both extremities of the syphons are full of sap in spring and early summer, an upward and downward current is immediately established. When the downward current has nourished the plant and stored up its starched granules for the ensuing spring, the leaves fall, the syphon structure and action is interrupted, and all the tubes (they are a second time single tubes) convey moisture from above downward, as happens in autumn. As the vascular expansions or networks are found also in the stems of plants, it may be taken for granted that certain of the tubes are united in spring, the upward rush of sap being followed by a slight downward current, as happens in endosmose and exosmose. As, moreover, the spongioles of the roots and the leaves are analogous structures, and certain tubes are united in the roots, the downward current in autumn is accompanied by a slight upward current. This accounts for the fact that at all periods of the year, the upward, downward and transverse currents exist; the upward and downward currents being most vigorous in spring and autumn, and scarcely perceptible in winter. Furthermore, as some of the vascular expansions in the leaves are free to absorb moisture, etc., in the same way that the spongioles are, it follows that the general circulation may receive an impulse from the leaves or from the roots, or both together, the circulation going on in a continuous current in certain vessels."

This original effort of the learned lecturer on physiology, at Surgeons' Hall, in Edinburgh, published in 1874, to explain some of the most difficult problems of vegetable life by a mere hypothesis, which assumes that sap flows in the vessels; that there are spongioles in the leaves which absorb water; that the sap descends to the roots and escapes from them in autumn; and that an imaginary system of syphons does all these wonderful things, which have not been proved to occur at all, and which well-informed physiologists are almost unanimous in denying, reminds us of the adage that "a prophet is not without honor save in his own country." This is not the method of the Baconian philosophy.

CIRCULATION OF SAP.

In the observations which follow, we hope to add some new facts to the knowledge of the world concerning the phenomena of plant-growth; but are painfully conscious of the need of much more investigation before a complete and correct theory of the circulation of sap can be stated. Exceptions have been taken to the use of the expression "circulation of sap;" but since there is an evident distinction between the crude and elaborated saps, both in their composition and their location in the plant, at least in the higher forms of vegetation, and since the circulation of blood is accepted as a proper term even when applied to animals without a heart, we prefer to retain it in our vocabulary.

OSMOSE.

In regard to the causes which induce the absorption of water and soluble substances by the roots of living plants, it seems unfortunate that so much has been claimed for osmose in this connection. Boussingault has recently shown

that roots containing sugar do not exude it when growing in water, while leaves and fruits when immersed in this fluid, readily absorb it by an osmotic process and part with their sugar. If the enormous absorption of water by the roots of birch trees, in spring, were accompanied by any corresponding exudation, it would appear easy to find it; but no one has yet detected it. It is not possible to account for the fact that when sap is rising most rapidly, none will flow from a wound in the bark, even when it will run a stream from the outer layer of wood, if the circulation in the trunk is caused by osmose. There is fresh cellular tissue in the liber, and some soluble material, but the bark remains comparatively dry till growth begins. After the cambium has become abundant, why should not all the crude sap press toward it and draw the elaborated material directly into the wood, instead of pushing its way against the force of gravity to the leaves, if osmose is so powerful an agent in the circulation? If this tendency to press into the bark were to exist, there would be a much greater flow from places that are girdled than is now observed; and probably the bark itself would be ruptured by the pressure exerted, which would often be equal to more than thirty pounds to the square inch.

A SURPRISING FACT.

One of the most surprising facts to be noticed in examining the wood of any tree with well-developed foliage, is the entire absence of anything like free or fluid water. A freshly-cut surface of the sap-wood is not even moist to the touch; and if a tube be inserted into the trunk of such a tree, it will frequently absorb water with great avidity. On the sixth of June last, a half-inch tube six feet in length was attached to a stopcock inserted into the trunk of an elm and the tube filled with water. The absorption was so rapid that the fluid disappeared in thirty minutes, and this was repeated several times the same day. Similar observations were made upon white oak, chestnut and buttonwood trees.

IMBIBITION.

Now the absorption was not osmotic, since the rapidity of it was too great and there was no outward flow, but apparently the result of imbibition, or the affinity of the cellulose of the woody fibre for water. Is not this, then, the proper name for the force which carries up the crude sap?

PER CENT OF SAP.

The wood of growing trees when cut from near the surface, though apparently dry, contains nearly fifty per cent of water; and in the young twigs, with a living pith, the proportion is even greater. A number of analyses have been made of specimens collected at different seasons during the past year, of which a tabular statement is appended.

SAP IN THE BUDS.

There is good reason to believe that the sap in ordinary trees begins to move first in the buds, and that the first supply of water exhaled in the spring is derived from the sap-wood. Branches of aspen and red maple, two feet in length, were cut on the twenty-sixth of March and placed in a warm room in an empty vase. The flower-buds developed without any other water than what they could abstract from the wood, so that on the fifth day the staminate catkins of the aspen were four inches long, and the pollen well developed. It is by no means uncommon to see large branches, which have been removed from

apple trees early in the spring, covered with blossoms in a similar way while lying on the ground.

It is a well established fact that the roots of most woody plants have not power at any season to force water to any considerable height when separated from their stems. Upon this point a large number of observations have been made, which will be described in another place.

THE ROOTS

of all plants growing on ordinary soil develop most freely and absorb most abundantly when the earth is well drained and aerated. Thus we find that the crude sap imbibed by the root-hairs from the surface of the particles of the soil seems to be taken up in a dry state, that is, it appears to be absorbed molecule by molecule, no fluid water being visible, and carried in this form through all the cellulose membranes between the earth and the leaf, by which it is to be digested or exhaled. We do not say this is literally true, but it accords very nearly with what is constantly to be seen in some species of plants. The circulation of the sap in a poplar tree is very dry compared with that of the blood of any animal. Not a drop of moisture will ever flow from the wood of an aspen, so far as we have observed. Nevertheless, it grows very freely and starts very early in the season.

THAT LIVING CELLULOSE

has a peculiar and very powerful affinity for water is evident from the experiments of De Vries, who discovered that when a shoot of an herbaceous plant with large leaves is cut, and the fresh surface allowed to come for a short time into contact with the air, it loses much of its absorbing power and the leaves wilt. If, however, the section be made under water, so that the living tissue is not exposed to the air, its power of imbibition remains unimpaired, and the leaves do not wilt.

SOLID SAP.

It appears, therefore, that much of the crude sap passes through the membranes of the sap-wood or woody fibre or cellular tissue of plants in an apparently solid form, combined with the cellulose, just as the water in dry slacked lime or a plaster cast is in a solid form. In all these cases it may be obtained as a liquid by distillation at a temperature of 212° Fahrenheit. The cause of the motion seems to be the removal of the water from the tissue at some point by exhalation, by chemical combination, or by assimilation. Whenever any portion of the living cellulose has an insufficient amount of water to saturate its affinity, it imbibes an additional quantity, and this process is continued from cell to cell downward, or backward to the roots and the earth.

THE CONDUCTING POWER

of the cellulose of sap-wood is very remarkable, as is seen in the fact that whenever a limb of an apple or peach tree breaks down under its burden of fruit, it very rarely wilts or fails to ripen its crop. Those who have compared the area of a section of the trunk of a large tree with the area of a section of its branches at any point above, must have noticed that the relative amount of sap-wood rapidly increases as we ascend toward the top, the young twigs and branches containing no other wood.

AN ELM IN AMHERST,

famous for the beautiful symmetry of its form, and known as the Ayres elm,

was carefully measured by Prof. Graves and the senior class. The area of the sections of the branches twenty feet from the ground was more than twice as great as the area of a section of the trunk four feet from the earth, and the proportion of sap-wood was of course much greater.

AN INTERESTING EXPERIMENT

was undertaken in the Durfee Plant-house to determine how small a proportion of sap-wood could conduct the necessary supply of sap to the foliage of a growing tree, and also whether the bark alone could furnish the requisite water to prevent the leaves from wilting. A specimen of *Hibiscus splendens*, standing in the ground and having three stems from the same root, was selected for trial. The shrub was growing rapidly, and was prepared for the experiment as follows: Two of the stems were tied firmly to stakes, and the third left undisturbed. The first specimen had all the bark removed from one inch of the stem, and then the wood was cut away till there remained only a small piece of the outside layer of sap-wood, which was one inch long and seven-sixteenths of an inch in circumference. This exposed surface was immediately covered with grafting-wax to protect the tissues from the action of the air. The amount of stem remaining was just one eighty-fourth of the original, which was about four inches around. The healthy leaf-surface was fully twenty-five hundred square inches, from both sides of which exhalation went on to some extent, making five thousand square inches of exhaling surface. The result was that the foliage remained perfectly fresh and vigorous for ten days, until, on the tenth of November, the specimen was cut for the museum.

THE OTHER STEM

was used to determine whether by osmose, or in any other way, the crude sap could ascend in the bark and supply the leaves with water. All the wood and one-third of the bark were removed from a portion one-half inch in length, the exposed tissues protected by wax, and the branches so pruned as to leave only five hundred square inches of leaf-surface. The foliage all drooped in a single hour and never recovered. This experiment showed that the bark was altogether incompetent to furnish the requisite supply of crude sap to the parts above it, although it was thick and succulent, and much greater in quantity, when compared with the exhaling surface, than the piece of sap-wood which showed such marvellous conducting power. If osmose were the cause of the ascent of sap, it would seem that the abundant parenchyma of the bark, intimately united as it is with the wood by the medullary rays, must freely transmit the amount required in this case. But the leaves wilted and perished as quickly as if the entire stem had been severed.

A COUNTER MOVEMENT.

Having thus demonstrated that crude sap ascends chiefly in the sap-wood of exogenous trees, let us now consider a few facts which appear to prove that there is a counter-movement of elaborated sap which is for the most part confined to the bark.

It is well known that if a narrow ring of bark be removed from the trunk of a tree between the leaves and roots, then the deposition of wood ceases below the girdled place, though above it the growth of the season ensuing will be quite normal. This proves beyond dispute that the wood cannot convey that portion of the elaborated sap which is essential to growth, and that it can

be conducted only by the tissues of the bark, or the imperfectly-developed tissues of the cambium between it and the perfectly formed wood. Nevertheless, there is free communication in a transverse direction for the crude sap and for some of the elaborated substances between the wood and the bark, probably by means of the medullary rays which connect the two. Thus only can we account for the fact that the bark below a girdled place remains alive long after the deposition of wood ceases, and also for the circumstance that starch and sugar, which must originally come from the leaves, are found either accumulated in the cells of certain stems and roots, or existing in the sap which flows or is expressed from their tissues. If we shave off, little by little, the bark of a maple when the sap is flowing freely, we shall observe no exudation from any portion of the liber, even, but as soon as the whole of this is removed, the sap issues from every part of the surface.

Again, those who work with mill-logs tell us that in the spring the bark becomes soft and loose, precisely as if the tree was standing, at least in the case of some species. Sometimes logs and poles, cut for fences, will sprout and actually produce shoots with foliage, the sap of which must be derived wholly from the timber, and must, therefore, pass from the wood to the bark.

Mr. Wm. F. Flint has sent us a piece of a red maple slab, which he found on moist ground, under a pile of wood, and which had thrown out at the end and sides a callous a quarter of an inch thick, precisely like an ordinary cutting of a grape vine. Here we have an instance of growth without either roots, buds, or leaves, all the material for which must have been derived from the stick itself.

A CURIOUS CIRCUMSTANCE.

Similar to this in character is the curious circumstance, not very unfrequent, of old potatoes resolving themselves into several smaller ones, within the skin of the parent tuber, without any external appearance of vegetation. This is reported to have occurred in a vast number of tubers, in a quantity of potatoes on board a vessel in the Arctic ocean, where the low temperature probably exerted some influence in causing this peculiar mode of sprouting.

AN EXCELLENT DEMONSTRATION

of the transverse diffusion of sap was obtained in some experiments performed to observe the result of protecting girdled places on trees from the effects of exposure. Healthy young trees, or large branches, of elm, chestnut, apple, grape, and white pine were drawn through glass tubes, two inches in diameter and two feet long, upon either end of which were fastened short pieces of rubber hose. These tubes were placed over girdled spots, from which the bark was removed on the thirtieth of May last, and the rubber securely fastened with iron wire to the tree. From all of these specimens a considerable quantity of sap escaped, apparently in the form of vapor, and was collected in the tube. There was no layer of wood formed, but the foliage of all except the pine was killed before autumn, apparently by the fermentation of the sap and its re-absorption into the wood. In the case of an elm root, treated in a similar manner, the bark was renewed, probably from the fact that the cambium was in a more advanced state than in the other instances. The root was dug up with care, twenty feet of it drawn through the tube, and then covered again with earth.

THE FUNCTIONS OF THE BARK.

With the view of determining some facts concerning the functions of the bark in connection with the circulation of sap and the growth of wood, many experiments have been undertaken at the College during the past two years, and some interesting results obtained.

In order to learn whether the annual layer of wood upon trees is developed from the outside of the old wood or from the inside of the bark, the following plan, suggested by the interesting experiments of Duhamel more than a century ago, was tried. Vigorous young trees of elm, glaucous willow, and chestnut were selected, which were from two to three inches in diameter. On the thirtieth of May, before any deposition of recent organized tissue was visible, but when the bark was easily separated from the wood, a horizontal incision was made with a sharp knife around each stem, and immediately above this four vertical incisions on the four quarters of the stem about three inches in length. The four strips of bark were then carefully detached from the wood at their lower ends, and a piece of tinned copper, one inch wide, and long enough to reach around the wood and overlap, was adjusted to the trunk. The bark was then replaced and covered tightly with cloth which had been dipped in melted grafting-wax. The trees grew through the season as usual, and after the fall of the leaves the bandages were removed and the results observed.

In all cases the new wood was found to have been deposited from the bark and outside of the metallic band. Examination under the microscope showed that a thin layer of parenchyma, corresponding to the pith of the first year's wood and such as probably unites all the layers of wood in exogenous stems, was formed upon the metal, and outside of this the fibro-vascular tissue, while the medullary rays were as numerous as in the other portions of the layer of wood, and extended directly from the bark to the metal under it, whether examined in a transverse or a longitudinal section, thus proving that the material did not flow down in an organized condition from above the band.

THIS QUITE SATISFACTORY RESULT

demonstrates that the elaborated material formed in the leaves descends altogether outside of the wood, and that the inner bark is the most highly vitalized part of the trunk of a tree and the source of the new layers of wood and bark which are annually produced.

Much information has also been obtained in regard to the effects of ringing or girdling the trunks and branches of trees by the removal of a band of bark only, or of bark and sapwood from the entire circumference.

This has long been practiced in new countries to kill the timber which the settler had not time to fell, but must destroy to obtain grain and other crops.

THE CHINESE

are said to produce curious dwarf fruit trees by ringing a fruit-bearing branch and placing over the spot a flower-pot with earth in which roots are developed, so that it may then be detached from the parent tree and cultivated independently. The Italians propagate the fig tree in a similar manner, and this process may be made very useful in securing the certain growth of a sporting branch of any woody plant, or of the branches of species with spongy or pithy wood which will not root from cuttings. It is a well known fact that the ringing of a branch of a vine or tree will tend to increase the size of the fruit

the following season, because the branch is thereby gorged with elaborated material for which there is no outlet, and some persons habitually adopt this mode of improving their fruit.

A GIRDLED ORCHARD.

In the town of Southborough, Mass., is an apple orchard of healthy trees, from twelve to sixteen inches in diameter, which were all girdled by the owner, Mr. Trowbridge Brigham, in the spring of 1870, for the purpose of inducing fruitfulness. The desired result is said to have been obtained, and the trees seem to have suffered no material injury, owing to the imperfect manner in which the operation was performed. At the time when the trees were in full blossom, a narrow belt of bark, usually less than an inch in width, was removed from the trunks, about two feet from the ground. This did not peel freely in all cases, and there were many crevices where it was retained. By means of these connecting links, the communication between the leaves and the root was imperfectly preserved, and during the season new wood and bark were developed upon these places. In addition to this, in many cases, the new wood from the upper side of the girdled spot was sufficiently abundant to reach across and form a connection with the living bark below.

Upon one of these trees was found a branch some four inches in diameter, which had been perfectly girdled in 1870, and, although no communication had existed between the bark of the branch and that of the trunk, it had grown every year till March, 1874, when it was cut. The buds upon it were poorly developed, but alive, and the ends of the branches were dead. It apparently could not have survived more than a year or two longer, and the reason was obvious upon making a longitudinal section through the girdled part. The limb was nearly horizontal, and the ring of bark removed was only a few inches from the trunk. New layers had formed each year up to the denuded place, but the enlargement was more above this than below it. The material to form new wood and bark below came from the other parts of the tree, and yet, owing apparently to the poor circulation, was deficient in quantity. The crude sap with some materials from other portions of the tree ascended to the buds and leaves, and so an unhealthy growth was continued. An examination of the figure representing a section of this branch will explain the cause of its final failure. The wood through which the sap must ascend was gradually dying, and thus the channel of communication was constantly becoming more and more obstructed. On the whole, this method of treating orchards cannot be recommended for general use.

In regard to the length of time during which a perfectly girdled tree may continue to live, we have obtained some facts worth recording.

IN INDIA,

it is necessary to girdle the teak trees the year before cutting them, in order to have them die and lose a portion of their sap by evaporation, since otherwise the logs will not float down the rivers to market. Removing a ring of bark is not sufficient to accomplish this result, and it is necessary to cut through all the sap-wood so as to prevent the ascent of water to the leaves.

EFFECTS OF GIRDLING.

Mr. W. F. Flint has communicated an interesting account of a beech tree about eighteen inches in diameter, which grew in an open pasture in Richmond, New Hampshire. It was girdled for the express purpose of killing it,

in 1866, by chopping a gash two or three inches wide and nearly as deep entirely around the trunk near the ground. The next year it sent up sprouts from below the girdle and formed a new layer over its entire surface. This was repeated in 1867, but in 1868 the bark and sprouts of the lower part died, and dead branches began to appear in the top. This process of decline continued, and in 1873 but one of the large branches put forth its leaves; and, finally, on the ninth year (1874) it died utterly. This remarkable tenacity of life is doubtless due to the close, fine texture of the timber, and the fact that such beeches in open land have an unusual amount of sap-wood, and are hence called white beeches.

A red maple, on the College Farm, which was girdled in April, 1873, by cutting a channel in the sap-wood two inches wide and one inch deep, bled most profusely, but grew as usual through the season. No wood, however, was formed below the girdle, and the bark died and separated from the wood. The roots, nevertheless, remained alive, and the tree has borne its usual amount of foliage during the summer of 1874, and formed its buds for next year, and produced a new layer of wood above the girdle. Specimens have been collected for chemical and microscopic analyses of the roots and of the wood and bark above and below the girdle, in the hope that some light may be thrown upon the subject of sap circulation and the functions of the bark, whenever this work can be done.

On the third of June last, branches of the apple, pear, peach, crab-apple and grape were girdled by removing a ring of bark one inch long. They grew well and bore an abundance of fine fruit, as was expected.

On the fourth of June, small trees of red maple, elm, aspen, willow, linden, chestnut, white pine, black birch, butternut, and a large wild grape vine, were girdled by removing a ring of bark two inches in length.

On the twelfth of June, trees of ash, bass, beech, black birch, yellow birch, white birch, alder, black oak, chestnut, sugar maple, hornbeam, and ironwood, were girdled in like manner; and on the twenty-third of June, specimens of white oak, red oak, black birch, yellow birch, white birch, red maple, sugar maple, ash, bass, aspen, witch-hazel, white pine, cornel, chestnut, hickory, beech, ironwood, hornbeam, apple, and choke-cherry. July twenty-first, we girdled specimens of wild grape, cornel, red maple, chestnut, black birch, white birch, white pine, bitternut, white oak and black oak.

On the twenty-eighth of August, the bark of the following species was found to adhere to the wood, viz.: Red maple, yellow birch, wild thorn, hornbeam, beech, witch-hazel, bird-cherry, white oak, red oak, elder and elm; while the bark of the following species was readily separated from the wood, viz.: Hemlock, white pine, alder, shadbush, white birch, black birch, chestnut, cornel, ash, ironwood, apple and aspen.

All the trees thus girdled grew through the season as usual, but none of them formed wood below the girdle, except the grape and the red maple. The former, being a branch of a large vine, with foliage both above and below the girdle, formed new wood on both sides of it, and finally, the two calluses were united and communication restored across it.

The red maple, girdled June twenty-third, formed wood only on the upper side; but the specimen girdled July twenty-first, formed a new layer of wood and bark upon the denuded surface. This was doubtless owing to the fact that a portion of the cambium was left on the wood sufficient to conduct the elaborated sap and form new tissues out of it. This tree, like the others, grew in

the woods, where it was shaded from the direct rays of the sun. The new bark was of a reddish brown color and very smooth, and consisted of a thin layer of periderm or cork, with parenchyma and bast. A drawing of its microscopic structure, together with one of the old bark on the same tree has been prepared.

There is a popular notion that the bark of an apple tree, removed on the longest day of the year, will be renewed, and it is well known that occasionally such renewal of the bark of various species does occur. This may happen whenever there is deposited upon the old wood enough of the new layer to conduct downward the elaborated sap, and to develop from the living parenchyma of the forming medullary rays a protecting layer of periderm.

It is not uncommon for the bark of the half-hardy weeping-willow to be started by freezing and thawing from the wood. When this is the case, there sometimes forms a new layer of wood upon the detached bark, which is disconnected from the wood of the parent trunk. There is also sometimes formed a new layer of wood and periderm on the old wood under the shelter of the old bark, and roots often descend from the healthy portion of the trunk several feet beneath the loose bark to the ground, and as soon as they penetrate it enlarge rapidly. All these phenomena are readily explained by supposing that the liber, or inner bark of the tree, is torn asunder, a portion sometimes remaining attached to the wood sufficient to conduct the elaborated sap, and so form a new layer of wood with a layer of bark. The roots are developed from the uninjured portion under the protection of the old bark, and in their nature are precisely like roots from cuttings.

EFFECTS OF FROST.

The rupture of the medullary rays and the separation of the bark from the wood by the combined action of frost and sunshine is not uncommon in the apple and other cultivated trees. If a severe frost separates the water from the wood as ice, and it then thaws and freezes again before it can be absorbed, it will be likely to burst the bark or tissues in which it is accumulated. This usually results in one or more cracks through the bark on the southerly side of the tree, from which there is, in the case of the apple tree, commonly a slight flow of crude sap in the following April or May. The outside of the bark is blackened, and the detached portions die.

In the spring of 1874, a vertical crack three feet long was noticed in the south side of a vigorous young Gravenstein apple tree in Amherst, the trunk of which was about three inches in diameter. Upon examination, it was found that the bark had not been separated from the thick layer of wood formed the previous year, but that this outside layer was entirely detached from the wood beneath. The bark, being supplied with sap ascending through this layer, remained sound, and the crack having been filled with wax, the tree grew equally well with others in its vicinity which had sustained no injury. The new growth on the sides of the crack being covered only with a thin, soft periderm, will doubtless readily unite, and there will soon remain no trace of the rupture. The separated layers of wood, however, will never be reunited, though the inner ones may conduct sap, until converted into the nearly impervious heartwood which occupies the central portion of every trunk after it attains to any considerable size.

At what age, if ever, the inner wood of exogens loses all power of conveying sap, and whether the sound heart of an old tree which has never been ex-

posed to the influences of the atmosphere still retains life, are questions which have not been definitely answered. It is not easy to say wherein the vitality of any perfectly formed tissue, whether of the wood or bark, consists, since their cells have no power of enlargement or multiplication, though the thickening of the cell walls by the deposition of substances within the cells and the striking changes in color seem to indicate the presence of a feeble life. The functions of the wood seem to be mainly such as may be performed by dead material. The cellulose which has never been exposed to the air may retain its peculiar affinity for water, which is evidently much greater before than after drying. The cells may serve as reservoirs of starch and other substances which may afterwards be imbibed by the living, growing or ripening tissues. The pith, which is alive in young branches so long as leaves are borne upon their wood, dies, apparently, with them. If growth is a characteristic feature of living tissue, our trees may with some reason be considered annuals, since all their growth proceeds normally from their winter buds and completely envelopes every portion of the tissues of the roots, stems, and branches previously formed, thus excluding them from the weather and preventing their decay, while using them for a support and a magazine of supplies. However this may be, it is certain that the vitality of trees is concentrated in a remarkable manner upon the surface and the extremities of their roots and branches.

NATURAL GRAFTING.

Among the observations made during the past season, not the least interesting were those relating to the natural grafting which is frequently to be seen in the forest, and which is particularly noticeable among roots. The almost incredible manner in which the living surface of the inner bark of woody stems can transform the same elaborated sap into different species of wood and bark, was alluded to last year, and the case mentioned of a possible compound tree, containing a plum root and base, on which grew a stem of apricot, surmounted by a stem of blood peach with red wood, and that by a stem of white peach, and the whole by a stem and branches of almond. Thus, each kind of wood and bark would be perfectly developed from the same material, just as on the same cow's milk may be fed a child, a calf, a colt, a black pig, a white pig, and a lamb. The specific life of each, and not its food, determines its form, size, and character.

A COMPOSITE TREE.

To show still more impressively the peculiar powers of the wood and bark to conduct the crude and elaborated saps in either direction, and to act either as roots or branches, as circumstances require, we will describe an experiment performed by a French gardener, M. Carillet, at Vincennes, in 1866 and 1867. He selected two dwarf pear trees, grafted on quince roots, which were from four to five feet high. One of them was carefully dug up in April, 1866, and fastened in an inverted position above the other. The leading shoots of the two trees were now flattened on one side with a knife, and the two surfaces firmly bound together in the usual manner of splice grafting. The two shoots grew together, and, in the course of the summer following, a few leaves appeared on the main stem of the inverted pear tree, and also on the main branches of the quince roots, which were entirely in the air, some eight or ten feet from the ground. The next spring scions from four varieties of pears were set upon the four main branches of the quince roots, two of which lived and grew several inches. Meanwhile, the inverted pear tree bore two pears.

Here, then, was a composite tree, consisting, first, of a root of quince, then a pear tree, upon this an inverted pear tree which had branches consisting of inverted quince roots, and these were surmounted by pear shoots of two unlike kinds. Upon such a specimen it would be very difficult to comprehend the working of the imaginary syphons of Dr. Pettigrew, already described.

In order to illustrate the fact that the return of the elaborated sap was not the result of the force of gravity, a pendant branch of weeping willow was girdled last June. The enlargement was on the lower side of the girdled place, showing that the flow of the material formed in the leaves was constantly towards the roots.

To learn whether sap would flow from the bark on the upper side of a girdled place, a stem of white willow, an inch in diameter and ten feet high, was selected, and a ring of bark one inch long removed. The girdled place was then wrapped in oiled paper, so as effectually to exclude the air and the light. On the fifteenth of October, one month after girdling, the paper was taken off, and the specimen examined. The wood appeared dead and brown, and was covered with a mucilaginous fluid which appeared to have come from above. There was no sign of growth below the girdle, but above it the stem was decidedly enlarged, and a callus had descended a quarter of an inch and developed upon itself a bud, as if about to strike out for air and light. No bleeding from the bark was observed in any case worthy of mention, the nearest approach to it being in the flow of turpentine from the bark and sap-wood of the white pine.

Among the specimens of natural grafting obtained during the past year, perhaps the most remarkable was a fine bunch of mistletoe growing as a parasite upon a branch of oak. This was kindly procured for the College museum by Prof. J. W. Mallet, LL.D., of the University of Virginia. The shrub is an evergreen, and its roots penetrate the bark and sap-wood of the tree on which it feeds, appropriating the crude sap and forming a wood of a totally different sort from that of its support, and having an ash peculiar to itself. In fact, the several species on which it is produced seem to serve merely as so many different soils on which it can thrive. As the oak branch was dead beyond the mistletoe, it would seem to have been injured by the abstraction of its sap and its exhalation from the foliage of the parasite.

A specimen of red maple was brought to the College by Mr. Austin Eastman, of Amherst, which exhibited a single trunk with one heart, formed by the natural union of two shoots, which were nearly three feet apart, and were united about six feet from the ground. The main trunk was eight inches in diameter.

Another specimen, found in Pelham, shows two white pine trunks, joined like the Siamese twins, at about four feet from the ground. This, when sawed open vertically, showed how the union had been effected. A branch of one had lodged in the angle made by a branch of the other with its parent trunk. As the tree grew, they were fastened together, and, under the pressure thus caused, the bark was flattened until it almost disappeared, and soon the new wood formed over the scar and made the grafting complete.

BUT THE GRAFTING OF ROOTS

is still more common and curious. They seem to cohere without the least difficulty, especially those of the white pine, which is doubtless owing to the softness of the bark and young wood, and the fact that they grow so nearly at the same level in the earth.

GROWING STUMPS.

From the observations above made, it will be seen that there is no difficulty in accounting for the curious fact which has long been regarded as a great mystery, that the stumps of fir trees, which do not sprout, have been known to continue forming new layers of wood and bark for a great number of years. Dutrochet mentions the case of a stump of the silver fir which thus grew from 1743 till 1836, when it was still alive, having formed since the tree was felled, ninety-two thin layers of wood. The roots of the living stump were doubtless grafted to the roots of some healthy tree or trees in its vicinity, and their elaborated sap was attracted into the sound bark and supplied the necessary material for the development of new tissues under the influence of its vital force. The outer layer of the roots of the stump was thus renewed annually, and so they retained their power of absorption; but since the top of the stump, becoming dry and having no foliage, could not exhale moisture, the crude sap of its roots ascended into the neighboring tree or trees to which they were united. Thus a sort of circulation was maintained sufficient to explain the phenomena observed.

ANOTHER PECULIARITY

often to be seen in the stems and branches of trees and shrubs, as in the pear, the apple, the hemlock, and the lilac, is the spiral growth or twisting of the wood and bark, which is sometimes visible during the life of such specimens, and always when the bark is removed and the timber seasoned. Some have endeavored to account for this phenomenon by referring it to the effect of the wind, but it is frequently seen on trees which grow in sheltered situations. The timber of *Pinus longifolia*, a valuable tree of Northern India, is often rendered worthless by this habit of growth; and while such trees are more numerous in some regions than in others, they are found irregularly scattered among those which do not exhibit this abnormal structure.

THE SURPRISING PHENOMENA

of pressure and suction exerted upon mercurial gauges attached to the trunks and roots of such trees as bleed or flow from wounds in the spring, which were described in the paper presented to the board last year, gave abundant encouragement for further investigation. Accordingly, numerous experiments have been undertaken and some thousands of observations recorded, which have been tabulated, and are appended in as compact a form as possible. To accomplish so much work as is here represented in a single season, required the cordial co-operation of a considerable number of persons. It is proper that the names of those officers and students of the college who have faithfully and intelligently labored to accumulate these facts should be announced in connection with what they have done. If all who enjoy the privileges of students in natural science would exhibit the same enthusiasm for the acquisition of new truths, they would thereby not only improve themselves, but increase the common stock of knowledge with a rapidity altogether unprecedented.

THE OBSERVERS.

Prof. Levi Stockbridge has made nearly all the observations on the flow of sap in the sugar maple, and has faithfully kept the record of the variations of pressure in the mercurial and water gauges on the sugar maple, the red

maple, and the butternut, which have been noted three or more times daily for several months.

Prof. S. T. Maynard has devoted much time to the care of the squash whose unparalleled performances in harness attest unmistakably its health and vigor. He has also kindly assisted in the preparation of gauges, and in every way in which his services were needed. The drawings for the cuts representing the squash and the apparatus used in the experiments with it, as well as for those relating to the specimens of elm, were furnished by him.

For the very convenient form of stopcocks used in the mercurial gauges we are indebted to the ingenuity of Prof. S. H. Peabody.

Much credit is due to Mr. D. P. Penballow, a post-graduate student, for his untiring devotion to the study of the squash vine, with which he spent many days and nights, observing its mode of growth and making complete microscopical drawings of all its structure. He also adjusted gauges to several herbaceous plants, and reported upon the pressure of their saps. He assisted in finding the per cent of water in various species of wood at different seasons of the year, and his pencil prepared all the drawings, except those already mentioned.

Charles Wellington, B. S., assistant in the chemical laboratory, has undertaken to determine the composition of various saps, and the effect on them of the advancing season. This important investigation is not yet completed.

Mr. Walter H. Knapp, with great fidelity, furnished the material for the table showing the amount of sap which flowed daily from each species.

Mr. Atherton Clark made the observations on the water gauges, except that on the sugar maple, on the mercurial gauges in the case of white birch root, the apple root, and the three on the grape vine, one of which was thirty feet from the ground. He also did much of the work relating to the time when each species begins to flow.

Mr. William P. Brooks began and carried out very thoroughly a series of observations to learn precisely what species flowed, at what time in the season, and how rapidly, visiting for this purpose about forty species daily for several weeks. In some unaccountable manner, the memorandum book containing most of his records has been lost, and so his report is incomplete.

Mr. Henry Hague recorded the variations on the mercurial gauges upon the four birches, one of them thirty feet from the ground; and on the hornbeam, three times daily for many weeks.

Mr. George R. Dodge attended to a series of experiments instituted to determine the circumstances which affect the flow of sap from the maples, and furnished an excellent report.

AMOUNT OF SAP.

It has been said that all species of flowering plants will probably bleed from some part, if wounded, at some time of their growth. This has not been demonstrated, and some trees seem to have a wood so remarkably spongy and retentive of moisture as to render it unlikely that they should ever flow. Much effort has been made to arrive at the truth on this subject concerning our common forest trees by methods detailed below.

About the middle of last March a large number of trees were selected and prepared for observation, by boring one half-inch hole to the depth of two inches into the wood and inserting a galvanized iron sap-spout, invented by Mr. C. C. Post of Burlington, Vt., and well adapted for use in the sugar-bush. The

species thus tapped, and all others named in this paper, will be mentioned by their common English names, which are familiar to most persons; but in order that these may be clearly understood, a list is appended containing both the English and the Latin names. The following were tested, as above described, for sap, viz.: Hemlock, black spruce, balsam fir, alder, European alder, striped maple, red maple, sugar maple, shad-bush, white birch, black birch, yellow birch, paper birch, hornbeam, chestnut, hickory, bitternut, cornel, thorn, quince, ash, beech, butternut, black walnut, mulberry, ironwood, white pine, yellow pine, buttonwood, aspen, English cherry, black cherry, mountain ash, apple, pear, peach, white oak, red oak, glaucous willow, white willow, bass, linden, elm, and grape. These trees were visited every day about noon for several weeks, the holes being renewed as often as necessary, and whenever they were found flowing the number of drops per minute was recorded, except in the case of such trees as flowed somewhat abundantly and for a considerable time. The whole amount of sap from those of the latter class was carefully collected and weighed daily. It will be seen that the sugar maple flows at any time when stripped of its foliage, provided the weather is favorable, the principal condition being a temperature above freezing, directly after severe frost. A comparison of the flow from this species with the pressure on the mercurial gauges, and with the temperature as indicated in the meteorological observations, kindly furnished by Prof. E. S. Snell, LL. D., of Amherst College, will convince the inquirer that there is an intimate connection between these three sets of facts.

THE QUANTITY OF SAP

from a sugar maple during the season is much greater than from any other tree flowing from the same causes. Thus the entire flow from the butternut was less than the product of the sugar maple for a single day. The ironwood and the birches, however, surpass even the maple, both in the rapidity and amount of their flowing, if we make allowance for the difference in the size of the trees tested. A paper birch, fifteen inches in diameter, flowed in less than two months one thousand four hundred and eighty-six pounds of sap; the maximum flow, on the fifth of May, amounting to sixty-three pounds and four ounces, which is probably three times the average yield of a sugar maple of the same size. These latter species will not bleed during the winter, and seem to do so in the spring from a cause entirely different from that which affects the trees which bleed in fall and winter. The grape, which is often thought to bleed more freely than any other species, though later in the season, really flows but little, the total amount from a very large vine being eleven pounds and nine ounces.

Among the species subjected to trial, only those mentioned as bleeding exhibited this phenomenon. The following flowed for a short time, or very irregularly, or very slowly. The shad-bush was seen to flow, on the eighth of April, one drop in fifty seconds. The hickory bled one drop per minute of very sweet sap, on the fifteenth of April, and the cornel, ten drops on the same day. The European alder flowed three drops per minute, April ninth, and the common alder, four drops, on the twenty-first of March, and on the tenth of April, nine drops from one spout and six drops from another, inserted six inches below the former. The black walnut yielded a small amount of sap during several weeks, and, March thirtieth, bled six drops per minute. The buttonwood flowed forty drops per minute, March twenty-fifth, and one hundred on a very cold day, the eighth of April. The total amount, however, was very small. The apple

bled twenty-eight drops per minute, May thirteenth, and the beech, on the tenth of May, flowed ten drops per minute, both yielding most sap in decidedly warm weather, the mean temperature for the last date being above 70° F. The latex of the mulberry exuded from the bark, on the ninth of April, as a transparent fluid which soon became milky, and the white and yellow pines flowed a small quantity of turpentine, apparently from both bark and wood.

A large red maple, which was thoroughly girdled in 1873, and whose bark had died and peeled off below the girdled place, was tapped above and also below it. The result was that it bled freely from both holes on many occasions. The flow, on the eighth of April, was fifty drops per minute from the upper one, and one drop from the lower one, while on the eleventh of the same month, it was three drops from the upper and fourteen drops from the lower one.

After the usual run of sap for the season has ceased, some species will bleed from the stump, if cut down, just like many herbaceous plants. Thus, Mr. Wm. F. Flint reports that large trees of the black, yellow, and paper birch, when felled on the thirtieth of June last, did not bleed immediately, as in April, but after an hour or two began to exude sap freely.

On August twenty-eighth, twenty-four species of young trees were cut down, about one foot from the ground, to see whether they would bleed. None did so immediately, but fifteen hours afterward the black birch ran a few drops, and the following were moist on the top of the stump, viz.: alder, yellow birch, red maple, cornel, ironwood, apple, elder, elm, and white pine. August thirty-first, the black birch bled a little, and the yellow birch, thorn, apple, glaucous willow, elm, and white pine were moist. The rest, including hemlock, shad-bush, white birch, chestnut, hornbeam, beech, ash, witch-hazel, bird cherry, white oak, red oak, and aspen, were perfectly dry, though all were sheltered from the sun.

THESE RESULTS

seem to include most of the important attainable facts in regard to the flow of sap as exhibited by our common exogenous trees, and, while none of the observations can be exactly repeated from the nature of the phenomena, yet they may safely be accepted as the substantial truth concerning the whole subject.

WATER GAUGES.

The interesting facts observed last year, in connection with the attachment of mercurial gauges to the roots and trunks of trees which were known to bleed from wounds, and the suggestions derived from them, were a powerful stimulus to further investigations in this direction. Accordingly, a large number of gauges were prepared in early spring, and, as soon as the weather was suitable, attached to such trees and roots as gave promise of the most valuable results.

There still remained the unaccountable fact that the larger number of trees and shrubs did not show any tendency to bleed in spring, and therefore could not be made to answer any inquiries put to them in regard to the circulation of sap. It was thought best to adopt a cheaper and simpler form of gauge for application to such species as gave small promise of useful results. For this purpose, the following economical apparatus was devised and applied to the roots of elm, ash, white oak, chestnut, apple, sugar maple, and hickory. A straight glass tube, three feet in length, with a bore about one quarter of an inch in diameter, was joined by a conical rubber connector with each of the

detached roots, and the roots again covered with the earth in which they grew. The tubes were now fastened in a vertical position to stakes set near the ends of the detached roots, which were one inch in diameter. They were then filled with water to a certain point, which was carefully marked, and the changes occurring noted every day. Sometimes the water in a tube would sink away, showing an absorption of the fluid by the roots; and, again, it would rise and flow over the top of the tube, demonstrating the fact that the absorbing power of the root was, sometimes at least, in excess of the affinity of the cellulose of the wood for water. It was well established that the wood of the roots of trees is in a condition in early spring to absorb with avidity the water from the tubes, while later in the season many of them exude water freely, so as to cause the tubes to overflow. The amount of absorption was recorded in inches, the minus sign being prefixed to the numbers, while the exudation was measured in a similar way, with the omission of the sign. Thirty-six inches of water in one of these tubes weighed one ounce, and from these data it was easy to learn the actual amount of water which was taken up or thrown off daily by each species.

ONE OF THE MOST REMARKABLE DISCOVERIES

in this connection, is the entirely unexpected fact that the roots of the sugar maple do not exude any sap from their wood when protected from frost, and show less independent power of absorbing water from the soil than almost any other species. Hence, there was no flow from the root into the tube at any time, but a constant moderate absorption of water from it.

THE FLOW

from the root into the tube is similar to that observed in the tube of an ordinary osmometer; but this does not prove that osmose has any influence in this matter, and the doubt about it is not diminished when we see the water moving, sometimes in one direction and sometimes in another. In the sugar maple, the flow was always out of the tube into the wood of the root; in the white oak, the absorption from the tube was, in some cases, as much as one ounce in thirty minutes, but rarely the current was reversed and absorption occurred from the ground; while, in the elm, the absorption from the tube was at its maximum April fifteenth, and then gradually diminished until April twenty-first, from which date the flow into the tube continued till June thirtieth, when the observations were suspended.

A SECTION

of a white oak root, eight inches long and one inch in diameter, which was freshly dug from the damp earth, April eleventh, and weighed, was then placed with one end in water three-eighths of an inch in depth, and in ten hours absorbed 3.19 per cent of its weight. This shows that the tissues were far from saturated, and were in an excellent condition to facilitate ordinary root absorption. A mercurial gauge attached to a root of white oak showed on the twelfth of April a suction sufficient to sustain a column of water 10.20 feet in height, which was caused by the absorption of the water in the connecting tube between the gauge and the root.

THE MERCURIAL GAUGE,

which was used for determining the variations of the pressure exerted by the sap of such species as are noted for the abundance of their flow, consisted of a

syphon-tube of thick glass, the two legs of which were eight feet long, and about four inches apart. This was inverted and attached to a support of inch board, on the center of which was fastened a scale divided to tenths of an inch. To one leg of the tube at the top was adjusted a brass stopcock, by means of small rubber hose, and to the stopcock was connected by a brass coupling a piece of thick lead pipe of small bore and convenient length, which was joined by another stopcock to the trunk, root, or branch which was to be tested. The stopcocks were so made, with a tube on the top, that communication could be opened between the free air and either the lead or the glass tubing at pleasure, and, when closed from the air, the passage was open between the mercury in the syphon-tube, the water in the lead pipe and the sap in the tree. The object of this three-way cock was to facilitate filling the tubes with water and mercury, and allowing the escape of any gas which might find its way into the apparatus from the tree. A sufficient quantity of mercury was poured into the inverted syphon to fill the two legs to the height of about forty inches, and the remainder of the leg connected with the tree, as well as the lead pipe, was carefully filled with water, all air being excluded. The other leg of the syphon-tube was left open to the atmosphere. When the sap exerted a pressure, it was indicated by a depression of the mercury in the closed leg of the glass tube and a rise in the open end, the difference between the two columns showing the pressure in inches of mercury. Suction into the tree was marked by the rise of the mercury in the closed leg and its depression in the open one, and in making the record the minus sign was prefixed to the figures expressing the number of inches of mercury.

One of the difficulties encountered in these experiments arose from the liability to leakage, either around the stopcock inserted into the tree, or from accidental wounds to the bark or small branches. In cases where the pressure was very great, it was sometimes necessary to solder a heavy sheet of lead to the stopcock and nail it to the tree with a packing of white lead in oil. Much trouble was also experienced from the bursting of the lead pipes and the breaking of the glass tubes during severe cold weather by the formation of ice within the gauges. To avoid this as much as possible, the gauges were enclosed in wooden cases, and the more exposed portions wrapped in woolen blankets.

Mercurial gauges were attached to the following species, viz.: sugar maple, red maple, black, yellow, white and paper birches, ironwood, apple and grape; and all the observations may be found in the appended tables. The general results correspond with those of last year, but are much more complete, especially in regard to the two species which exhibit the most surprising phenomena and in which the public feel the deepest interest, namely, the sugar maple and the grape vine.

PRESSURE OF SAP.

As soon as the discovery was made, by means of the water gauge, that the apple would flow from the root, a mercurial gauge was attached to a root an inch in diameter. At first, on the fifteenth of May, there was a slight suction amounting to -1.59 feet of water; but the pressure soon began, and rose to its maximum, May thirty-first, when it equalled 15.07 feet of water. Thus, the extreme variation was 16.66 feet.

The butternut had a range of only 13.03 feet, the minimum, -0.79 foot, occurring on April tenth, and the maximum, 12.24 feet, on April fourteenth.

The red maple attained its minimum, -2.83 feet, April sixteenth, and its

maximum, 18.59 feet, April eighth, the total variation being 21.42 feet of water.

The ironwood exerted its greatest suction on the nineteenth of May, which equalled -24.60 feet, while the greatest pressure was 40.35 feet, and was observed May thirteenth. The total variation was thus 64.95 feet of water.

The white birch began early in the season, April ninth; reached its minimum, -19.26 feet, on the eleventh of May, and its maximum, 39.66 feet, April twenty-third. The extreme variation was, therefore, 58.92 feet of water.

A gauge was attached to a root of white birch on the eighth of April; the pressure began April twelfth, and steadily advanced to its highest point, 38.08 feet, May twelfth, and declined to zero, May twenty-third, and to its minimum, -22.98 feet, August twenty-sixth, the extreme variation amounting to 61.06 feet of water. The root was dug up in October and found apparently alive and healthy.

The black birch root last year exerted the astonishing pressure of 84.77 feet of water, but was not observed through the season. This year, on the eighth of April, a gauge was adjusted to a root of the same tree, and, although the pressure was not quite as great as last season, the extreme variation was 102.68 feet. The first pressure was, April twenty-third, and the highest, May tenth, and equalled 77.06 feet, while the greatest suction was on September fourteenth, and amounted to -25.62 feet of water.

The pressure is evidently caused in these roots, which are entirely detached from the tree and lie in the earth just as they grew, by the activity of their power of absorption, which seems to be greatest just as the buds are about bursting. The suction is remarkably powerful, and must apparently result from some chemical change occurring in the root, after the root-fibres have lost their absorbing power. A critical examination by the chemist and the microscopist would probably give an explanation for this phenomenon.

The paper birch tree reached its maximum, May sixth, when the pressure was equal to sustaining a column of water 61.20 feet in height. The suction on June fourteenth was -7.93 feet, and the extreme variation for the season was 69.13 feet.

On the eighth of April, a gauge was attached to a yellow birch tree near the ground, and, on the twenty-fourth, at noon, the pressure was 73.67 feet of water. A hole was then bored into the tree at a height of thirty feet above the lower one, for the purpose of putting up another gauge. The mercury in the lower gauge fell at the rate of four inches per minute, till it stood at a point representing 35.13 feet of water. The sap, at the same time, flowed freely from the upper orifice. The usual difference between the gauges thus placed thirty feet apart was from twenty-four to thirty-five feet of water, showing evidently that the power furnishing the pressure was from below, that is, from the root. The maximum of the lower gauge was 74.22 feet, April twenty-second, and the minimum was -22.44 feet, May sixteenth, and, hence, the total variation was 96.66 feet. The upper gauge attained a pressure of 41.25 feet, on the ninth of May, and sank to -11.11 feet on the thirteenth of May, the extreme variation being 52.36 feet of water. After the development of the buds, the upper gauge stood uniformly at from -1 to -4 feet of water, and the lower one was mostly minus.

THE BLEEDING

of a broken grape vine, in 1720, induced the Rev. Stephen Hales, an ingenious observer of nature, to attach mercurial manometers to the stumps of vine

branches and stems, by means of which he obtained a maximum pressure of forty-three feet of water. These experiments were made on vines of the species *Vitis vinifera*, in the comparatively cool and moist climate of England. It is, therefore, not surprising, that the more vigorous *Vitis æstivalis*, in the more fervid and sunny climate of Massachusetts, should exert a greatly superior force. In order to determine as many facts as possible concerning the flow and pressure of the sap of the wild summer grape, two of the largest vines on the College estate were selected and prepared for observation. The smaller one was about three inches in diameter at the ground, and spread over a young elm, some forty feet in height, and standing in moist, open land. One of the main roots of the vine was uncovered and followed from the stem toward its extremities, a distance of four feet, where it was cut off. To the large end of this detached root, the remainder of which was left undisturbed in the soil as it grew, was firmly fastened a stout piece of rubber hose, which was connected by means of a stopcock to the lead pipe of a mercurial gauge. This was on May-day. The tissues of the root, which had not yet awakened from its winter sleep, at once began to absorb the water from the gauge, and the next day there appeared a suction equal to -4.53 feet of water. This continued, though gradually diminishing, till it reached zero, on the tenth of May. From this time the pressure still increased until, on the twenty-ninth of the month, it became sufficient to sustain a column of water 88.74 feet in height, which is more than twice as great as the maximum observed by Hales, and the greatest pressure ever produced by the sap of a plant so far as we know. It is an interesting fact that this maximum occurred on the warmest day in May, the mean temperature having been 71.7° F. It is also noteworthy that, on the very day when the gauge first showed pressure, the vine which was tapped began to flow, though it was half a mile distant. The pressure on the gauge steadily diminished through the season, and, on the fourteenth of September, amounted to 19.35 feet. The extreme variation was 93.27 feet of water, and, therefore, 9.41 feet less than in the case of the black birch root, which exhibited a much greater suction, though less pressure, than the grape root.

The other vine selected for trial was nearly four inches in diameter and more than fifty feet high. To a large branch of this, near the ground, was attached a gauge by means of a rubber hose, the branch being cut off for that purpose. A second gauge was secured to another branch at the height of thirty feet above the first, and observations made upon them once, twice, or three times, daily, from May seventh to June thirtieth. After this, occasional visits were made to the vine, though the variations were very slight. The pressure on the lower gauge began on the seventh of May, when it was 11.11 feet of water, and reached its maximum on the twenty-sixth day of the month, equalling a column of water 83.87 feet in height. The pressure declined quite rapidly as soon as the buds began to develop, and fell to zero June thirteenth. The greatest suction was exhibited on the twenty-ninth of June, and was equal to sustaining a column of water 14.39 feet high. During the month of July, when growth was most rapid, the suction was uniformly about -7.37 feet of water, and during August about -4 feet. The extreme variation on this gauge amounted to 98.26 feet, though the pressure was somewhat less than was shown by that on the detached root of the vine already mentioned.

The upper gauge was not reached by the sap rising from the root until some days after pressure was manifest at the lower one. On the twelfth of May the lower one stood at 34.11 feet of water, and the upper at 3.40 feet. The maxi-

imum pressure was attained May sixteenth, and was 39.66 feet, while the greatest suction occurred June twentieth, and was -10.77 feet. The extreme variation of the upper gauge was 50.43 feet. The difference between the two gauges was usually from 20 to 30 feet of water; but when the pressure on the lower one was greatest, the difference was 60.41 feet, in consequence of the fact that the force was entirely from the root, and the wood of the vine was a hindrance to the sudden upward thrust of the sap. After the foliage was developed the suction was limited to from -6 to -12 feet of water, on account, doubtless, of the porous character of the foliage and young branches, and there was no great difference between the gauges.

THE FLOW OF SAP FROM THE SUGAR MAPLE,

so familiar to all, and yet so variable and peculiar, was the first object of investigation in the beginning of these experiments in 1873, but its mysterious fluctuations were not fully known nor understood until the close of the year 1874. The extraordinary facts that the flow occurred in midwinter and early spring, when the ground was covered with snow and there were no signs of life; that the flow began only during mild days immediately following a severe frost, and ceased usually after a few hours; that when a cavity was cut into a sugar maple tree the sap flowed down from above, while in a birch it flowed most freely from below; and especially the fact that when a gauge was attached to a tree, it exhibited the most surprising variations from great pressure, during the day, to powerful suction at night,—these, and other unaccountable things, seemed to demand special effort to discover all the phenomena attending the flow of maple sap; and then, if possible, to invent some rational explanation of them.

Accordingly, a large number of experiments were devised and carried out, with a very great amount of labor and no little expense. Among them were the collection and weighing of all the sap which would flow from a healthy tree, from November to the following May; with a careful observation of the times when the flow began and ceased, in each case of good sap-weather; the collection, weighing and analysis of sap during different periods of the entire season, both from the usual level and from the top of a tree thirty feet from the ground; the collection and examination of the gas which escapes with the first flow of sap from the orifice first made in a tree in the spring; the effect of increasing the number of holes upon the total flow of sap and the entire product of sugar; the result of tapping trees at various elevations from the earth, on different sides, and to different depths; and finally, a record for comparison and study of the fluctuations in the mercury of several gauges, attached to various parts of the same tree, as observed three or more times daily.

A SHOWER OF SAP.

Mr. Samuel F. Perley, of Naples, Maine, in an interesting communication containing much valuable information derived from his large experience in the sugar-bush, relates the following incident: "Happening, on a bright, sunny morning, to visit a sugar tree standing in open land, and having a large, spreading top, I was surprised, on walking beneath the limbs, to find quite a smart shower falling upon me. On looking up I could see no clouds, yet the drops were falling thick and fast in all the area covered by the branches of the tree. An examination showed the drops to be drops of sap flowing from

innumerable broken twigs. I then remembered that a day or two before there had been a storm of sleet and rain, which had encased the trees with a heavy coating of ice, and following that a violent wind, which had twisted and broken many of the smaller branches. From these was now flowing a brilliant shower of sap, sparkling in the bright sunshine. I could not perceive that this wholesale tapping diminished at all the flow from the trunk, or in any manner injured the tree."

ICICLES

of frozen sap are not unfrequently seen depending from the branches of maple and butternut trees during severe cold weather, when the temperature rises only slightly above 32° F. at mid-day. On Thanksgiving Day, 1874, the thermometer, in the shade, indicated 32° F. at 2 P. M. A sugar maple was tapped at the ground, and fifty feet above it, and while there was no flow from the lower orifice, the upper one bled four drops per minute.

EXPERIMENTS WITH THE SUGAR MAPLE.

On the twentieth of November last the weather was cold, and at 11 A. M. there was a rapid fall of soft snow, followed by a rising temperature. At half-past twelve P. M. the mercurial gauge in the top of a sugar maple indicated a pressure of about nine feet of water, while a gauge at the ground showed neither pressure nor suction.

In the case of a tree tapped in 1873, on the north and south sides, in order to compare the flow from each, it was found that, for some reason, the north spout yielded nearly twice as much sap as the south one, and flowed two weeks longer. It appears probable that this was an exceptional instance, and possibly to be accounted for by the fact that the roots of the south side ran under a highway, while those of the north side luxuriated in a rich meadow.

In 1874 another tree about sixty feet in height and four feet and ten inches in girth was subjected to the same trial. The total flow from the south side was eighty-six pounds and four ounces, while that from the north side was sixty-eight pounds and five ounces. Near the close of the season only did the flow from the latter exceed that from the former. There can be no doubt that it is much wiser to tap all sugar trees on the south side, because the sap will flow earlier and more abundantly than from the shaded side, while the late sap is of little value to the sugar-maker.

Another sugar maple, seventy feet high and four feet in circumference, was tapped on the south side in five places, the holes being two feet apart on a vertical line, so that spout number one was near the ground, number two directly above number one, number three two feet above number two, and so on. During the month of April the sap from each spout was weighed daily, and the results were as follows, viz.: The total flow was one hundred and twenty pounds and one ounce. From number one, near the ground, was collected seventy-eight pounds and ten ounces; from number two, twelve pounds and two ounces; from number three, five pounds and ten ounces; from number four, eight pounds and seven ounces; and from number five, fifteen pounds and four ounces. These facts are, in the main, what would be expected from the other observations made concerning the flow of maple sap.

The effect of increasing the number of spouts inserted into a tree was tried on two red maples, which flow much less than the sugar maple and for a shorter time. Ten spouts in one tree, sixty feet high and four feet eight inches in girth, were found to flow, during the first half of April, seventy-eight pounds

and eight ounces, while one spout in a similar tree flowed less than half as much, or thirty-five pounds and two ounces. There can be no doubt that the quantity of sap obtained from a tree by the use of many sprouts is greater than that from a limited number, but it is not likely to contain so large a per cent of sugar. Still, if it be true, as seems probable, that the withdrawal of sap exerts no deleterious influence upon the health and vigor of a tree, and the sap is richest early in the season, it would seem best to insert more spouts, and so extract the sugar in its purest condition as rapidly as possible. This, of course, would necessitate a greater expenditure for buckets, which might possibly counterbalance the advantages of the new method. Experiments might be easily instituted to determine the facts in regard to this matter by any intelligent sugar-maker.

In regard to the origin of cane sugar in the sap of the maples, the butternut and the black walnut, we must, for the present, admit that we have not yet discovered it; though the singular fact that the species which yield this sugar belong to that class of trees which only flow freely after severe frost seems to indicate that freezing and thawing may have some influence upon its production.

COMPOSITION OF SAP.

It will be seen from an examination of the table relating to the composition of saps, that the sap of the wild grape is almost pure water, and that it contained, on the fifteenth of May last, no trace of either cane sugar, glucose or starch. There is, however, in the wood of the roots and stems of the genus *Vitis*, a great quantity of a colorless, translucent, almost tasteless mucilage, which is abundantly exuded from the pores of a cross section made at any time when the roots are dormant. Very little even of this seems to escape from a bleeding vine, which may account for the fact that the flow of crude sap from the grape does not perceptibly affect its subsequent growth or productiveness.

THE SAP OF THE SUGAR MAPLE

contains from two to three per cent of cane sugar, while that of the red maple yields only about half as much. The sap of the latter is said by Mr. H. M. Sessions, of Wilbraham, also to contain some ingredient which attacks iron, forming a very dark-colored syrup when evaporated in pans of that metal. It is, therefore, better to exclude it from the sap gathered for the manufacture of sugar.

In order to obtain as much information as possible in regard to the sap of the sugar maple, an analysis was made of the gas contained in the tree when first tapped. This was procured by inserting a stopcock into the sap-wood of a tree twenty feet from the ground. To the stopcock was attached a glass tube by means of a rubber connector, and the tube passed through a cork into a large bottle, reaching to the bottom. As soon as the bottle was filled with sap, it was tightly closed and taken to the laboratory, where the gas was separated by boiling. The analysis shows that the gas contains much less nitrogen and more oxygen than atmospheric air, while the proportion of carbonic acid gas is about one hundred and thirty-four times greater in the former than in the latter.

As we do not know how or when the cane sugar is formed in the maple, we cannot account for the variations in the sweetness of its sap, which are, however, very great. As the flow depends upon the freezing and thawing of the

wood, and possibly upon the continuance of absorption by the roots to supply the drain upon the tapped tree, it is evident that a large body of snow upon the ground will favor it, since the earth will then be warmer and the night temperature of the air much colder than under other circumstances. It does not appear that there is any greater proportion of sap in the maple than in many other trees, but only that for some unknown reason it is separated in greater quantity by freezing, or else not reabsorbed after such separation so quickly as in other species.

CAUSES OF FLOW.

For the purpose of learning whether root absorption is necessary to keep up the flow of sap through the season, a large tree, sixty feet in height, and four feet and one-half in girth, was cut early in December, 1874, and firmly lashed in an upright position to neighboring trees. A fire was then kindled around the lower end of the trunk in order to dry and close as far as possible the pores of the wood. Next spring it is proposed to apply mercurial gauges to determine whether the sap moves, as in trees in a natural condition, and afterwards to collect and analyze the sap.

While it is certain that the flow of the grape and the birch results from the great activity of the absorbing rootlets when they first awake in spring from their winter's repose, it seems equally evident that root absorption has no direct connection with the flow of maple sap. This discovery was made by means of five mercurial gauges, which were attached with great care to a fine, vigorous tree, about sixty feet in height, on the twentieth of last March. The gauges were so connected with all parts of the tree that every movement of the sap would be indicated. Number one was joined to a stopcock inserted into the sap-wood about two feet from the ground, the hole being about one inch in diameter and two inches deep. Number two was connected by a stout rubber hose to a root one inch in diameter, which was laid bare by the use of a force pump so as to avoid breaking any of its fibres. This root was cut open at the distance of about two feet from the tree, and gauge number two united to the stump, which was attached to the trunk. Number three was joined in the same way to the large end of the detached root, which remained in the soil just as it grew. Number four was fastened to a piece of gas-pipe one inch in diameter, which was screwed into the tree to the depth of ten inches, a thread having been cut for this purpose on the outside of it. No sap could enter this gauge except at the very center of the heart-wood of the trunk. Number five was attached to the sap-wood among the branches, at an elevation of twenty feet above gauge number one. The gauges thus connected were then enclosed in tight pine cases, and the metallic pipes and stopcocks wrapped in woolen blankets to protect them from the cold. The observations were taken regularly at six A. M., at noon, and at six P. M. for about ten weeks, until the changes became unimportant. The table appended gives all the variations of sap pressure in different parts of the tree, as recorded at the times specified. A reference to figure 44 will convey a correct idea of the manner in which the mercury fluctuates during every hour of the day and night.

The following are some of the most interesting results obtained from the several gauges:

GAUGE.	Minimum.	Date of Minimum.	Maximum.	Date of Maximum.	Extreme Variation.
Gauge 1.....	-18.13	April 11.....	39.67	March 28.....	57.80 feet of water.
Gauge 2.....	-7.71	April 4.....	36.27	March 28.....	43.98 feet of water.
Gauge 3.....	-7.71	March 21.....	3.40	April 3.....	11.11 feet of water.
Gauge 4.....	-6.01	April 22.....	22.33	March 28.....	28.34 feet of water.
Gauge 5.....	-26.07	March 31.....	52.13	April 2.....	78.20 feet of water.

The wood of the detached root absorbed the water from the gauge, so as to exert a suction, like the roots of most other species of trees in early spring, but the pressure exhibited at any time was scarcely worthy of mention. So strange did this appear, that on the fourth of April the gauge was removed to a healthy root, detached from another tree, and to avoid any possibility of error, it was afterward connected with a third root, but the results were always similar. It is certain, therefore, from these observations, as well as those connected with the water-gauge, described on a preceding page, that the rise and flow of maple sap is not directly caused by the activity of absorbent rootlets.

Secondly, it is seen that the movements of the sap in the heart of a tree are much less rapid and vigorous than those occurring in the sap-wood at the same level. This is doubtless owing to the fact that the old wood is more dense, and therefore less permeable to fluids than the outer layers of alburnum; and also to the circumstance that the variations of temperature, at the depth of ten inches from the bark, are necessarily slow and limited.

Finally, it remains to consider the extraordinary fact that the greatest suction, as well as the highest pressure, was exhibited by the gauge in the top of the tree. On the eighteenth of April the lower gauge in the sap-wood indicated a pressure equal to 10.77 feet of water, while, at the same time, the upper gauge showed a pressure of 24.93 feet. On the thirty-first of March, the gauges were all frozen, number one standing at 28.90 feet of water, while number five indicated a suction equal to -26.07, a difference of 54.97 feet. In the case of number one, attached to the trunk near the ground, it seemed that the gauge froze before the body of the tree was much chilled, while, by the sudden freezing of the branches, the sap was abstracted from the upper gauge before the cold had penetrated the coverings sufficiently to freeze it.

On the nineteenth of April the upper gauge showed little or no pressure, while the lower one still indicated a pressure of 17 feet. This was apparently due to the absorption of the sap from the branches by the expanding buds.

In view of all the phenomena thus far observed, it appears that the flow of sap from the maple and other species, which bleed only after being frozen, is in no sense a vital process, but purely physical. The sap is separated from the cellulose of the wood by the cold, and, under ordinary conditions, gradually reabsorbed. If, however, the tree be tapped so that the liberated sap can escape, then it will do so, flowing, as is readily seen to be the case with the maple, most copiously from above. The bleeding is therefore a sort of leakage from the vessels of the wood, but this is doubtless increased by the elastic force of the gases in the tree, which are compressed by the liberated sap, and this expansive power must be intensified by the increase of temperature which always accompanies a flow.

CAUSE OF SUCTION.

This theory explains the fluctuation of the gauges, and accounts for the singular fact that the upper one shows the most pressure and the greatest variations, inasmuch as the branches and twigs would, of course, be most quickly and powerfully affected by the heat of the sun and the temperature of the atmosphere. The pressure of the expanded gases in a tree in a normal condition would facilitate the re-absorption by the wood of the liberated sap. Their contraction by cold would also cause the cessation of the flow from a tree which was running, and produce the remarkable phenomenon of suction exhibited by the gauges at night or during frosty weather.

An important and elegant demonstration of this theory was obtained by cutting large branches, fifteen to twenty feet in length, when the thermometer was below zero, from trees of the sugar maple, white birch, elm, hickory, buttonwood, chestnut, and willow, and suspending them in the warm air of the Durfee plant-house. The maple soon began to bleed at the rate of twenty-four drops per minute, while the buttonwood bled eleven drops, and the hickory exuded a little very sweet sap, precisely as in spring. The birch, elm, chestnut and willow did not flow at all, and were not even moist on the freshly-cut surface.

A mercurial gauge, attached to the end of a frozen branch of sugar maple, indicated pressure and suction when the temperature was raised and lowered, precisely as it would have done upon a maple tree during the ordinary alternations of day and night in the spring of the year when the sap is flowing.

In the warm regions of Asia, Africa, and America, are found about one thousand species of palm trees, from many of which a sweet sap is obtained in large quantities. This is simply allowed to ferment, and drank as palm-wine or toddy, or distilled for the production of a sort of brandy, or it is evaporated for the extraction of its sugar in the form of syrup, or of a more or less crystalline solid called jaggery. In the province of Bengal, in India, more than one hundred million pounds of palm-sugar are manufactured annually, while the total product of palm-wine in the world greatly exceeds that of wine from the grape.

PALM WINE.

There are three principal methods adopted in different countries for obtaining the sweet sap of palms. In Chili, trees fifty feet high are felled in such a way that the top will lie higher than the butt of the trunk, and the single terminal bud with the crown of leaves is cut off. The sap flows abundantly from the higher end of this log, and if a fresh slice of wood be removed every day the bleeding continues for several months. The yield is greatest during the warmest days, and amounts in all to an average of ninety gallons, or about seven hundred and twenty-five pounds from each tree. This sap is mostly evaporated and utilized as a very agreeable syrup called palm-honey.

IN INDIA,

it is customary to make incision into the wood of trees near the top, from which, during the cool months, the sap flows freely. From the common wild date-palm the annual yield of sap is about two hundred pounds, containing some eight pounds of sugar, or four times the average product of the sugar maple. Much the larger proportion of palm sap is obtained, however, from the large branching flower-stalks of the inflorescence. These are produced in

the axils of the immense leaves or fronds, and before they burst the spathe in which they are enveloped, they are carefully bound together with pieces of palm-leaf. These buds are then beaten every morning with sticks and a thin slice removed from the tip of the axis of inflorescence. From the freshly exposed surface the sweet sap runs very abundantly for several months. Indeed, some species continually send out new flower-stalks, which are constantly bled until, after two or three years, the tree dies from exhaustion.

SAP OF THE CENTURY PLANT.

But the most remarkable flow of sap is that of the *Agave Americana*, or century plant. This is the largest herbaceous plant known, the leaves of one in the Durfee plant-house being eight feet long and of immense weight. In Mexico, the sap of this species furnishes the favorite beverage of the people. This is called pulque, and has a most detestable odor of carrion and a slightly acid taste. The Mexicans are very fond of it, and natives of other countries soon learn to love it, and then prefer it to claret. The sap is procured by cutting out the bud of the inflorescence which appears in the centre of the massive crown of leaves, and, if undisturbed, develops into a flower-stalk from thirty to forty feet high and covered with thousands of blossoms. The cavity made by removing the bud is speedily filled with a sweet sap, and the total amount from one plant is stated by Von Humboldt to be from twelve to sixteen hundred pounds. The plant then dies from exhaustion.

It is impossible to give any satisfactory explanation for these extraordinary phenomena. It is easy to state that these plants produce large quantities of starch and sugar preparatory to flowering, but why should they continue to flow so long after the trees are cut down or the flower buds removed?

If it be true that the sap of plants flows to the points of consumption, it is still difficult to explain why it should persistently tend upward to the top of a prostrate trunk, or of a standing tree, for months after the bud, for the special nourishment of which it is designed, has been destroyed, and after the process of growth has been entirely suspended.

It is evident, in conclusion, that there yet remains ample room for investigation concerning the phenomena connected with the development of plants and the circulation of sap. Though we cannot hope to exhaust the subject, or to discover precisely what the force is which we call life, and which imparts to every species and individual of the vegetable world its peculiar form and characteristics, it is none the less important and interesting to exercise our utmost ingenuity in the effort to discover the times and modes of its operation, and its relations to the other forces of Nature.

GRAPE PHYLLOXERA.

AN ADDRESS DELIVERED BY PROF. A. J. COOK, AT THE MEETING OF
THE SOCIETY HELD AT MONROE IN JUNE, 1875.

PHYLLOXERA VASTATRIX. Sub Order *Hemiptera*. Family *Aphidæ*.

Of course, at this first meeting of our society, after the terrible winter just past, which was unprecedented in its extreme and long-continued cold, the burden of every story will be, "What changes does the new regime necessitate as to our varieties, method of cultivation, and efforts for protection." Yet in this discussion the grape, one of the glories of this whole Monroe region, and which makes a lasting impress on the minds of every one who is so fortunate as to visit this beautiful city in autumn, will receive little space, or attention. For safely buried beneath the reach of harm or danger, it may laugh at the rude blast, and need not shiver, either with cold or fear, even if the mercury freeze. We have long talked of the apple as the chief pride of the Michigan pomologist, the fruit ever reliable, and of quality the best. But in view of the trying ordeal of the past winter, does not this mantle of reliability at least seem likely to fall to the grape. Besides this luscious fruit, the grape has in our State no codling moth, no borer, no curculio, which as yet cause the pomologist to look anxious. To talk then, of aught relating to the grape, in this favored region, and under such happy auspices, is indeed very gratifying.

But is the grape free from all danger? The appointment of the Phylloxera Commission in France, and the offer of the princely reward of \$60,000 for an effectual remedy of this modern curse of France, Germany, and Italy, would quickly answer the question for those countries. Does the same danger threaten the destruction of our own vineyards? It is the province of entomology to give answer. Entomology stated years ago that the terrible locust of the west could never devastate regions others than immediately bordering the mountains of Colorado, thus quieting the anxieties of Illinois, Indiana, and Eastern Iowa and Missouri. How truly has time verified those predictions! Entomology stated years ago just as to the course of the Colorado Potato Beetle, and the statements as to its course and the time when it should reach the Atlantic, have proved so correct as to make men marvel at the prophetic power of science. Let this same science then recount the history, natural history, and habits of this latest comer of the insect scourges to the pomologist, that we may learn what is in store for our vineyards, that if free

from danger, we may work on encouraged to better effort, or, if threatened with dire calamity, we may early prepare to battle with the foe, and if possible vanquish it.

HISTORY.

The first account we have of this insect, which of late has caused so much excitement, was that given by Dr. Fitch in 1866,—a very brief and incomplete description, which appeared in his first report, p. 168. In his third report appeared quite a full description of one form of this insect, but very far from its full life history. This louse is found in two very different conditions,—one on the leaf, in galls, the other on the roots, causing the roots to become swollen and diseased, and finally to die. Dr. Fitch only described the insect as seen in the leaf galls, not knowing that the same insect existed in a different form and dress on the roots, there to work untold mischief. Several American authors afterward added to Dr. Fitch's description to the leaf form. In fact, no one even thought that the insect existed in any other form, till the *Phylloxera*—a name applying to the disease which the insect causes, as well as the insect—broke out in France some eight or ten years ago. After many erroneous theories had been offered as to the cause of this new blight affecting the vineyards so disastrously, Professor J. E. Planchon of Montpellier, France, stated the true cause: the sapping of the vitality of the vines by a minute plant-louse, which attacked the roots. A few months later, Professor J. O. Westwood, a very distinguished entomologist of England, announced that he had examined several root and gall or leaf lice, and that they seemed indetical. Very soon after, M. J. Lichtenstein, a fellow-townsmen of Professor Planchon, suggested that the root louse causing such havoc in France was the same insect as that described by Dr. Fitch a half score years before, only of different habits and in a different dress. In 1870, Professor C. V. Riley, State entomologist of Missouri, fully proved this identity, and in the following year visited France to the better prosecute his inquiries. For his skill and energy in these investigations, Professor Riley has received very flattering testimonials from France, and has truly merited the gratitude of his own countrymen. The present article is only in small part the result of my own researches, as I have had very little opportunity to make investigations on this all important subject, but is chiefly gleaned from the work-shops of other entomologists, chiefly Professor Riley, whose admirable reports, so full and complete, leave little to be desired.

Professor Planchon visited our country during the past summer (1874), and after very full investigations, he fully sustains Professor Riley in that the *Phylloxera* is an American insect; that the leaf louse and root louse are but different forms of the same insect, and other facts which will appear in the sequel.

The insect has spread so rapidly in Europe, and the evil has become so portentous, that it is attracting the attention of the ablest scientists, and scarcely a meeting is held, or a scientific paper published, that there is not more or less time and space occupied by this all-important subject.

Of course this exciting interest of our brothers over the water in a gift which we have bequeathed to them, has excited a lively interest among ourselves, and we shall see further on with what show of practical importance.

NATURAL HISTORY.

The generic name of this little devastator (*Phylloxera*) comes from the Greek, and means "leaf-withering." The genus is characterized by having three-jointed antennæ, the terminal joint much the longest (*see i, fig. 2*), and the wings overlapping flat on the back in repose (*see g, fig. 4*).

It belongs to the sub-order *Hemiptera*, or to the bugs; but these are *Homopterous*, the wings not being thickened at the base, giving the appearance of half-wings, like the squash bug, but are homogeneous throughout. In common with all bugs, these are provided with a strong sucking beak (*see a, fig. 2*).

This insect belongs to the family *Aphidæ*, or plant-louse family, with near affinities to the *Coccidæ*, or bark-louse family. Yet its resemblance to this lower family is confined mostly to the larval state, and this early resemblance to lower forms is, as first shown by the great and lamented Agassiz, true of all animals.

TWO FORMS.

As already intimated, there are two distinct forms of this insect, which differ much in their appearance, and totally in their habits. These we shall denote from the place where they respectively work, as the leaf form and the root form.

THE LEAF FORM.

In early summer, soon after the leaves appear, the wee yellow lice, with quite fully developed legs, antennæ and beak, commence to puncture the leaves. Thus irritated, the leaf commences at this point an excessive growth downward, forming a cup-shaped cavity, in which the louse is imprisoned, never to escape. There is an open mouth to this cavity at first, but soon the edges close above the louse. These galls are quite large, and later in the season as they become very abundant, can hardly fail to attract the attention even of the most unobserving (*see fig. 1*). The lower side of the leaf is covered with bunches, large as a small pea, while the upper side has corresponding depressions.



* FIG. 1.—UNDER SIDE OF LEAF, SHOWING GALLS.

These young lice (*see a and b in fig. 2*) grow rapidly, become dull orange, and as they begin to develop,—these are all females,—they become broader and seem more clumsy (*see f, g, and h in fig. 2*), from the fact that the legs, antennæ and beak do not keep pace with the growth of the other parts, and seem quite abortive, though the tarsi (*see j in fig. 2*)—a name given to the last joints of the feet of insects—are now two-jointed, where as before they were but single-jointed. Thus shut out from the gaze of all intrusive observers, the mother louse has a rare chance to concoct mischief, which she is not loath to improve, as is clearly indicated in the significant fact that she is soon sur-

*The cuts illustrating this article are from the skillful and accurate pencil of Prof. C. V. Riley, State Entomologist of Missouri.

rounded by several hundred eggs (see *d* in fig. 2). These eggs, like the young or larval lice, are of a bright yellow hue. In about a week the eggs hatch, when there commences a repetition of all that is narrated above. This continues for several generations. There may be as many as six broods in a year.

As fall comes on with its chill and cold, the lice seem to betake themselves to the roots. Yet, it is possible that some of them pass the winter in the galls of the leaves, as they lie under the vines.

As yet there have been no males discovered among these leaf forms, *h*, imago gall, louse from side, above and below; *i*, nor do any of them possess wings. antennæ; *j*, tarsus—side marks show true size.

Another peculiarity, which also applies to the root form, they are all oviparous,—that is, the eggs are first deposited and then hatch as is the case with our birds and fowls. Nearly all of the aphidæ or plant-lice are oviparous, that is, the hatching takes place within the parent louse, and the young come forth alive.

It would seem from the facts stated above, that these lice would become infinite in numbers, even in a single season, and so they would were it not for natural enemies. Other insects destroy hosts of them, while a species of mildew (*Botrytus reticola*, Berkeley) seems to attack and destroy many, especially late in the season. As this is a species of fungi, I presume it will receive general attention at the hands of my colleague, Prof. Beal, who is to instruct us as to these lower forms of plant life.

As these gall-making, leaf forms are always apterous, without wings, agamic, or produce young without males, or appear to be so, from our present knowledge, they seem an intermediate stage of cycle development. Plant lice usually produce males and females in autumn, which mate, and from the eggs which those females produce come forth usually apterous agamic females, only which produce usually *ovoviviparous* females, and these the same, till autumn. Hence it seems probable that these leaf forms are the intermediate forms of this phylloxera. Only these are exceptions to the usual law of being *ovoviviparous*.

A very noteworthy and important fact in this connection is that these leaf forms seem to discriminate in the varieties which they attack. They seem to prefer the Clinton, Taylor, and other closely allied varieties, which seem to have come from the river-bank species (*Vitis riparia*). Furthermore, it is a gratifying fact that these leaf forms, in their role of gall producers, do but slight harm.

Prof. Riley at first thought this form a necessary element in the cycle of development. But further investigations have convinced him that they are not necessary, but rather an accidental dimorphic form, depending, may be, on the variety of grapes, and perhaps somewhat upon the compactness of the soil about the vines.

The presence of these galls on the leaves of herbarium specimens collected

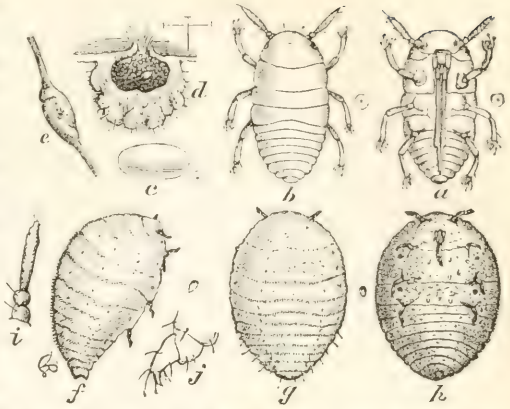


Fig. 2.— *a* and *b*, larvæ as seen from below and above; *c*, egg; *d*, gall; *e*, enlarged tendrils; *f*, *g* and *h*, imago gall, louse from side, above and below; *i*, antennæ; *j*, tarsus—side marks show true size.

many years ago show that this form has long worked on the leaves of some of our native plants.

ROOT FORMS.

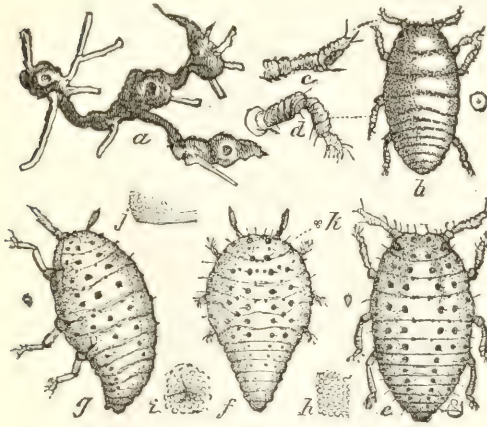


Fig. 3.—*a*, diseased roots; *b*, larva louse; *c*, antenna; *d*, leg; *e*, *f*, and *g*, imago root lice; *h*, granulations on skin; *i*, tubercle.

The root forms, when they first hatch (see *b* in fig. 3), are not to be distinguished from those of like age from the galls, so it is quite likely that they may come from not only the eggs of the root lice, but also from the late hatched gall lice, as it has already been stated that the last of the leaf lice hibernate on the roots, and quite likely some of the young gall lice pass to the roots during the season. But soon the root forms become greenish yellow and covered with warts or tubercles (see *e*, *f*, and *g* in fig. 3) which serve very easily to distinguish these underground species from those which attack the leaves. That in this underground abode, im-

mured in total darkness, with very different food, these insects should develop some unimportant differences, does not surprise the entomologist, who has learned to expect such marvels, for still greater changes sometimes occur. As is well known, the queen and worker bees start from eggs exactly similar, but a more roomy palace and a copious supply of royal jelly induces such a development in the queen as would serve to so mislead the uninitiated, that they would readily mistake her for an entirely different species.

As is common with plant lice some of these root lice remain much like the larvæ or young lice in form, though becoming a little more swollen, especially in front (see *f* in fig. 3), never acquire wings, and spend their lives for the most part in laying eggs, each insect laying to the number of two or three hundred. Others remain oval, acquire wing stubs (see *e* and *f* in fig. 4), and finally very ample wings (see *g* and *h* in fig. 4). These are of a brighter yellow than the *apterous* root-lice, and before moulting their last skins these winged forms come up from the earth, and then as if to show that the warts were marks only appropriate in darkness and dirt, unfit for the light, the body is entirely rid of its tubercles. These winged lice, though most abundant in late summer and early autumn, may be seen from early July till growth of the vine ceases.

The large majority of these winged lice (see *g* and *h* in fig. 4) are of large size, and are also agamic females, the eggs being easily discerned in the transparent body. The eggs are few. The smaller seem the same except that they are abortive. Something like worker bees. Their bodies are very short.

These winged individuals, small as they are, can by use of their ample wings and the wind make extended journeys. No one who has collected small insects, thus having occasion to study and observe their habits, can for a moment doubt this ability. Prof. Riley has seen them dart forth with great swiftness, upon being released from confinement, while in France they have been frequently observed, entrapped in spider webs. The peculiar office then of these winged forms, which always appear in the annual cycle of develop-

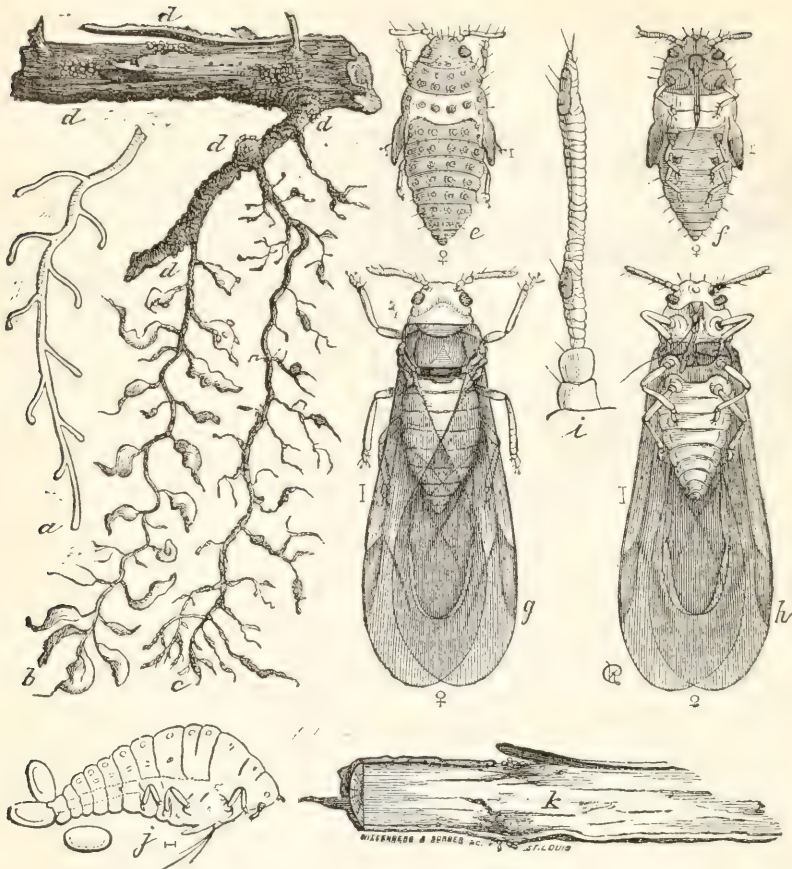


Fig. 4.—*a*, healthy root; *b*, root on which the lice are at work; *c*, deserted root where decay has commenced; *d*, lice on large roots; *e* and *f*, pupæ; *g* and *h*, imagos with wings; *i*, antenna of same; *j*, wingless female on roots depositing; *k*, section of root.

ment, would seem to be to scatter mischief. Without these the lice would seldom spread to other vineyards; with them dispersion is easy and wide spread.

These winged agamic females deposit their eggs on the vines, and from these eggs, which are of two sizes, come the true sexual individuals, the females from the larger, and the males (see fig. 5) from the smaller. After pairing these true females lay a single egg and perish. Here the cycle is complete. From this single egg hatches a very prolific agamic female, which may remain on the leaves, though more generally she betakes herself to the roots. We see that the individuals keep getting less and less prolific from the first agamic female to the sexual forms which lay but a single egg.

We see then that the species is continued through the winter either as eggs on the roots,—or possibly on the vines,—or as young or larval lice, domiciled on the

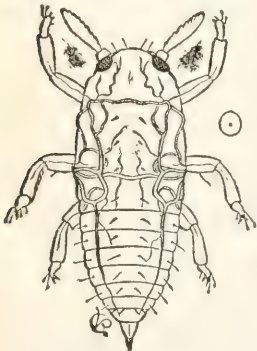


Fig. 5.—Male.

roots, some from the single eggs laid by the true females, others from eggs deposited by the apterous agamic root lice, while still others immigrated from verdant homes among the leaves, seeking these underground abodes that they may be free from the perils of winter's storms. Speaking of these young lice, and their habits in spring, Prof. Riley says: "All, so far as I have seen, become agamic mothers and assume the degraded form,"—wingless root form already described—"one generation of the mother form follows another,—fertility increasing with the increasing heat and luxuriance of the summer,—until at last the third and fourth has been reached, before the winged lice make their appearance, in the latter part of June or early in July."

These root forms seem no less discriminating than the leaf forms, as they attack certain varieties of grapes, leaving other varieties almost entirely alone. Those varieties which seem the most susceptible are the foreign grapes, varieties which have sprung from the species *Vitis vinifera*. Those which seem exempt from the leaf forms are unable to sustain the ravages of the root forms, and utterly perish in two or three years after they are attacked. The first year only the small roots are affected; these become covered late in the seasons with nodosities or swellings. The second year these die, and the main roots present a similar appearance, consequent upon being punctured,—the leaves look yellow,—while the third year frequently witnesses decay of the main roots and death of the vines. Of vines grown in our own State, the Catawba and Iona seem most susceptible to attack from the root lice.

With the exception of the Iona, Diana, and Delaware, all the varieties recommended by this society resist pretty well, as does the Norton's Virginia, which is considerably grown about this place.

It will be seen that these root forms are not like the leaf forms, comparatively harmless, but are exceeding harmful, and unless they can be checked, either by nature or art, bid fair to exterminate one of the most important industries, or at least change it materially by effecting a wholesale change of varieties in those regions where this industry assumes the greatest proportions and highest importance.

It may be asked why it is, if the above statements are correct, that Europe has so long been exempt from this terrible scourge. I answer, for the same reason that the Rape butterfly, the currant slug, and the more noted Colorado potato beetle, have not been injurious to our interests at an earlier date, or this same grape pest detrimental to the grape interest of our own California, where foreign grapes are grown with a success unsurpassed, simply because they were an importation from our own country, and had not been earlier introduced. Had entomological science been fostered instead of derided, the full history of the Phylloxera might have been earlier discovered, and by the caution which knowledge would have induced, one of the most serious plagues the world has yet seen might have been held at bay, and property of untold value saved to the world. It yet remains to be seen whether wisdom will prevail, and our own golden shores of the west saved from a like calamity. To any of us who have been so favored as to behold the magnificent vineyards of Los Angeles, Santa Clara, and Sonoma, the above question comes with telling force and significance.

It may have occurred to some of you to ask, why it is that this insect, which is so great a plague in Europe, has not worked similar injury to American grape culture, having, as before stated, co-existed in our country with the grape perhaps from the first. To answer with absolute correctness would be impossible.

Several very probable reasons appear to offer quick solution to this seeming enigma. All insects are held in check by natural enemies. Were this not the case, their astounding fecundity would soon banish all other life from the globe. Now, remove any insect to a new region, and for a time it will be comparatively free from molestation. It will take time,—often long years,—to develop enemies that will seek it out, and seriously interfere with its prosperity. The Hessian fly, long known, yet little dreaded in Europe, was introduced into America at the time of the revolution, and I need not to tell you of the fearful havoc wrought by this tiny insect during the first years after its introduction among us. With the increase of its enemies, some of which were very like also imported, it has become powerless to excite our fear, or even anxiety. The Rape butterfly, introduced from England in 1859, worked immense damage at first, but recent reports say that a parasite bids fair to cut short its terrible work of destruction, so that in all probability it will soon be no more dreaded here than in the land of its nativity.

So too of the Phylloxera, very likely it has enemies here, that lessens its numbers and harm, whereas in France it works its destruction all undisturbed. That time may develop its enemies abroad is probable, so that it would be safe to predict that time would bring a diminution of the evil to our transatlantic friends.

Again Darwinism, or the doctrine of natural selection, would induce such hardiness in our native varieties as would successfully resist the attack of such constant foes. And in the struggle for life, only those varieties, or better species would be preserved, which through some obnoxious flavor were free from attack. Varieties too, which the skill of man had obtained from these native species, would be more certain to resist the blighting effects of the root form of the Phylloxera, and very likely this fact, together with man's selection from these varieties, cultivating only the hardy ones, which probably owed this desirable quality to some peculiarity which exempted them from these fatal sappers, is probably what has freed us from one of the worst of the modern pests of the pomologist.

ARE WE IN DANGER?

In view of the fact that the Phylloxera is an old resident among us, and that grape-growing has been unattended with any serious calamity all these years, I think it safe to predict that the vine-dresser may possess his soul in peace, and work on with the best of hope and courage, and all well seasoned with gratitude that, partly through the aid of natural enemies of the *Phylloxera vastatrix*, and partly because of hardy varieties, he is saved from a scourge that seems to know no moderation in its withering work, which, if unchecked, bids fair to ruin the vintage of the long famous "vine-clad hills of Europe." Should the Iona, Catawba and Delaware prove unprofitable because of this pestiferous louse, we can try what is now being extensively tried in Europe—graft them on to such stocks as the Oporto, Concord and Clinton, which resist so well. Though this practice is regarded hopefully in Europe, and by many here, still Mr. Addison Kelley, who has had some experience, has, he writes me, little faith in its efficacy. I would earnestly urge such experiments on the islands, and at Point aux Peaux. [Since writing the above, I have visited Kelley's Island and witnessed the terrible havoc wrought by these lice to the Catawba, Delaware and Iona grapes, yet see no reason to doubt the beneficial effects of grafting these varieties on more hardy stocks.] Should this prove unsatisfactory, either from failing to rid us of this pest or from producing grapes of

undesirable flavor, we may discard these varieties entirely, and still be rich in varieties, so long as we have the Concord, the Hartford Prolific, the Israella, Rogers No. 4 (Wilder), No. 9 (Lindly), No. 22 (Salem), and No. 15 (Agawam), all of which seem to resist the Phylloxera very well, and the attendant evils of mildew and late ripening of fruit, with a bright prospect of obtaining still other and more desirable varieties by skillful crossing and selecting from those which have proved insect-proof. Yet it behooves us all to look into this matter of the Phylloxera, for very likely much of our ill success with certain varieties has been owing to a cause of which we had no knowledge, or even suspicion.

Yet in our sister State of the far west,—California,—of which we are all so justly proud, where foreign grapes are so extensively and successfully grown, the danger is obvious and threatening. Isolated as she is, and protected by such lines of mighty earthworks as the Sierra Nevada and Rocky Mountains, and by 6,000 miles of unbroken ocean, whose untiring surges are ever speaking to those golden shores of warmth and safety, she has heretofore been free from not only the grape scourge, but scores of other insect ills which her less fortunate sisters of the east have to endure. But unmixed good seldom comes to us; and California, though she will reap great benefit by the breaking down of those high walls of isolation through the skill of the engineer and the energy of commercial enterprise, will the sooner become a prey to the vast horde of insects which, from the Eastern States, Europe, and the Celestial Empire, are eager to slip in and possess so fair an empire. Already there is some evidence of the presence of the Phylloxera in those magnificent vineyards that reach far up the hill-slopes of the Sonoma and Napa valleys. What State can so illy afford to neglect entomology? During a three years' residence in that State I saw hardly the mark of an insect in any of her many and varied fruits,—a state of things which can only be perpetuated by calling in the aid of entomology.

REMEDIES.

The only remedy which has so far proved effectual, despite the efforts of all scientific Europe, impelled by the stupendous interests involved and the largest prize ever offered for a like object, is that of flooding the land. It is found that submersion for thirty or forty days after the season's growth has subsided is absolute extermination to the lice of the vineyard and no injury to the vines. This will lessen the gloom for California, as her irrigating arrangements will afford excellent facilities for submersion.

Bisulphide of carbon, so useful in protecting our zoological museums from insect pests, has also been tried with some success as a destroyer of the grape phylloxera. To use it, holes are punched into the earth, the fluid turned in, and then the holes filled up with earth. The gaseous emanations from this very volatile substance penetrating the earth destroys the lice and not the vines. Yet this substance, which at first gave great hope to the sufferers, is not found a practical remedy. It is too costly, too difficult of application, not sufficiently effective, and unsafe as a general preventive from its exceedingly explosive nature.

In the number for May 15 of that admirable English journal of horticulture, *The Garden*, it is stated that Prof. Dumas has found sulphuric carbonate of potash ($K_2S_2O_8$) an excellent remedy for this terrible pest. It is just sprinkled on the ground in form of powder, and the solution carried by means of rain

to the roots is said to effect the desired object. From the character of the compound (all potash compounds seem valuable) it would appear that this would be an aid in the wished-for extermination. I see by the late French journals that such men as Milne-Edwards, Duchartre, Blanchard, and Pasteur have experimented with the above with complete success, yet it is to be feared that inability to make any such applications sufficiently general, will ever preclude their effectiveness as practical remedies. Yet judging from all past human history, we must believe that a remedy wholly practical must one day be found, for has not human ability ever proved commensurate with human needs?

We see, then, that the question is answered. That notwithstanding the terrible *Phylloxera*, so ruinous in sunny France and genial Italy, is a native among us, yet we may hope and expect to sit under our own vine and partake of the richest treasures of the vintage, and though the storm king descend in still more wrathful mood among us, we still may expect to possess one fruit, and that, too, the peer of any in its healthfulness, varied uses, and delicious flavor.

THE OLD PEAR TREES AND APPLE TREES OF MONROE.

A PAPER READ BEFORE THE STATE POMOLOGICAL SOCIETY AT MONROE,
JUNE 30TH, BY EDWIN WILLITS, ESQ.

GENTLEMEN AND LADIES: The committee assigned to me the subject of the old pear and apple trees of Monroe. There was no suggestion as to how the subject should be treated, whether historically, botanically, or pomologically. If the latter alone, I assume they would have selected some other person more fitted for the task, as we do not lack those who could give the requisite information in more scientific phrases, or with more appropriate terms than myself. But as I have been more noted for the interest I have manifested in the history of the good old time that, like distance, "lends enchantment to the view," I assume I was to have full scope, with liberty to range where I would, and glean what I might think would be of interest, leaving the botanical and pomological facts to take care of themselves. If there should be any such worthy of record in the archives of the society, I will glean them out, and furnish an abstract thereof for the secretary. As it is, I desire to say what I do in good faith, and not for the purpose of using this occasion for the glorification of this goodly region that resounded to the revelry of a happy people when the Genesee valley was a wilderness and the beautiful lake region of New York the home of the savage and his prey. At least on this subject, I feel as did Roscommon when he said:

"I pity from my soul unhappy men,
Compelled by want to prostitute the pen,
Who must, like lawyers, either starve or plead,
And follow, right or wrong, where guineas lead."

THE ORIGIN OF THE OLD PEAR TREES.

Of course the first consideration to be regarded, is the origin and pedigree, as it were, of these old trees. No person living saw them planted. Four generations have been partakers of their fruits, but no one can tell from his own knowledge of their origin.

THREE SEEDS FROM FRANCE.

I addressed myself to the investigation of the subject, and the first person to whom I addressed my inquiries, was the son of a man now living in his

104th year. He told me those pear trees were raised from the seed; that three seeds were brought from France in a French *emigre's* vest pocket. "Three seeds," I asked,—“are you sure that was the number?” He replied that it was so reported to him. I thought it plausible, that all these generations of pear trees might have sprung from those three seeds; for, it will be recollected, that in the genealogy of nearly every old family in America, three brothers invariably came over the ocean together, and why not believe this of our pear trees? At least there was nothing inconsistent with this theory, except, as often happens to well digested theories, the facts in the case.

The truth is that the pioneer pear trees of Monroe came from the banks of Detroit River.

FRANCIS NAVARRE.

About the year that Wolfe scaled the heights of Abraham, and on the ramparts of Quebec gave his life for old England and her colonies in America, and by such sacrifice redeemed the continent from the sway of France, about the year 1759, was born on the banks of Detroit river one Francis Navarre. He was the grandson of a Francis Navarre who had been a soldier in the French army stationed at Quebec, where he served out his time, when that place was a French fort, some forty years before Montcalm lost it. Old Francis Navarre, led by the spirit of adventure, and the companionship of many comrades of like sentiments, coasted along the lakes in his dug-out canoe, till he came to the straits, "*D'Etroit*," as they called them; but we have so anglicized the name that it has lost its original significance. There he found a fur-trading station, a French military post, a missionary center and a few settlers,—old soldiers who had taken up lands and turned their spears into pruning hooks.

Francis Navarre was an educated man and at one time was the scrivener for this little colony on the outposts of civilization. At the time he came to the straits, a single pear tree, which in 1805 was said to be 100 years old, stood within the pickets with which the town was surrounded, where now commerce and capital thrive and the hum of a busy industry makes vocal the impulse of teeming thousands; and there it stood till it fell before the rapacious growth of the metropolis.

TWENTY YEARS ONWARD.

From this tree Francis Navarre, when he had selected his claim fronting the straits, transplanted two sprouts in his yard; and when this grandson first saw the light they had grown to be a foot in diameter.

Twenty years passed away, and with them had grown up a race of sturdy young Frenchmen who in their turn were to found new homes. They had much of the same spirit of their ancestors, the same vivacity, the same fondness for the dance, and the same light-hearted, chivalric nature. "The Straits" were occupied on both sides—what is now Canada and what is Michigan. The farms with their whitewashed houses along the river, stretched in narrow strips miles away into the wilderness, as may now be seen along the St. Lawrence. To be away from the river,—to have a home out of sight of its "glittering sheen," was not to be thought of. Still a new generation was to be provided for. Where was it to go?

THE FRENCH "VOYAGEURS."

In the three-quarters of a century that had elapsed since the settlement of Detroit, we can easily conceive that these French "*voyageurs*" who had coasted

the St. Lawrence and Lake Ontario, had carried their canoes around the Niagara, launched them in the waters of Lake Erie, and had followed its shores until the delightful "straits" came to their gladdened sight,—we can well imagine, I say, that these hardy "*voyageurs*" had not failed to explore every nook and outlet of the vast waters their enterprise had made known to the world.

THE RAISIN VALLEY.

From all accounts, in all their explorations no fairer spot was found than the region we possess this day. They had explored the Raisin valley. In their canoes they had left their homes on the straits, come down past Grosse Isle, across the head of the lake to Pointe de Peaux (Point of Furs), thence around Pointe de Roches (Stony Point) into a beautiful bay, thence across the bay to the mouth of a river. Ascending the river amid the wild rice for two miles, passing islands of the most luxuriant verdure, crowned with a mantle of grape vine, they came to where the rich bottom land yielded to high and sloping banks. As they rounded the bend near where the railroad bridge now stands, I can well imagine the beautiful scene before them. For centuries the Indians had made their camp fires on the banks of the river. At intervals the undergrowth had been destroyed and the grassy slopes beneath the groves of black walnut, elm, and maple were as inviting as the most artistic park designed by the landscape gardener. At intervals the wild, unbroken forest came to the water's edge, and cast the shade of giant trees into the river, and everywhere, in the wild-wood, and in the glade, on the river's edge, and as far away under the overarching trees as the eye could see, was a wealth of grape vines. Everywhere hung clusters of rich purple fruit,—everywhere with a wild luxuriance that far surpassed the stories their fathers had told of the vineyards of sunny France. Within the present century, from a point near the foot of the street on which this building stands to where the mill-dam has been placed, a man now living walked and climbed the whole distance, over 80 rods, on grape vines, climbing from tree to tree, without touching the ground. No wonder these warm-hearted, enthusiastic "*voyageurs*," as they paddled along up the river, cried out "*Le raisin !*" "*Le raisin !*" (the grape, the grape), and that they then named the beautiful river "*La Riviere au Raisin.*"

"LA RIVIERE AU RAISIN."

Below this spot and about where the largest pear trees stand, was a glade of perhaps 100 rods in extent. Across the river, between the two bridges, was another. Lower down, on the north side, on the swell of ground which the railroad bridge bisects, was another. In which of these glades the first party made their camp, tradition has not informed us; but that the party carried back to "the straits" such an account of the beauties of *La Riviere au Raisin* that other parties coveted the sight, I have no doubt. Even "the straits," in the plenitude of their beauty, could scarcely rival this little nook where nature had made a very "Acadie."

THE NAVARRE PURCHASE.

No wonder, then, when the young Navarre, at the age of twenty, began to seek a place to build his home, looked with longing eyes to the Raisin, and thought to possess one of the glades on its banks for his dwelling place. The land was then in the possession of the Potawatamie Indians. From the time when old Francis Navarre was scrivener at the picketed post at "the straits"

till his grandson began to put on the garb of manhood, the Navarre family had great influence with the Indians. Negotiations were begun, by which young Navarre was to have the title to all the south bank from the present position of the mill dam down to a point below the Canada Southern railroad, and subsequently he had a deed for the most of it, signed by five chiefs. His son, Robert F. Navarre, who, now eighty-four years of age, born under the pear trees, is now living two miles nearly south of them, says his father has repeatedly shown him where the posts stood which marked the boundaries of this Indian purchase.

THE SEVEN PIONEER PEAR TREES.

Here, then, Navarre came in 1780, and built his first cabin on the banks of the stream. Here, then, he planted his pear trees in the same year. He brought seven sprouts, the size of his finger, in his hands on horseback from "the straits." These sprouts came from the two old trees on his father's and grandfather's claim, which were, as I have stated before, sprouted from the old pioneer pear tree, that stood within the pickets, and which may have grown from one of the three seeds brought across the ocean in a Frenchman's vest pocket. From these seven pear trees have descended all or nearly all of the French pear trees of the county. Others were obtained at Detroit, but their quality not proving equal to Navarre's, were considered of not much account, and a ready market was found for these at three dollars each sprout.

THREE NOW LIVING.

Of the seven pear trees set out in 1780, three are now living. Since I settled in Monroe, nineteen years ago, two have died. They died, as many a strong man now dies, suddenly and without apparent cause. The season before their death, it was estimated one bore over forty bushels of pears. They have always been prolific bearers, every year laden with their golden harvest.

THE LARGEST

now standing is twelve feet six inches in circumference six inches from the ground,—ten feet seven inches, one foot from the ground; and at its smallest part ten feet in circumference. Four and one-half feet from the ground the trunk separates into two branches, at which point it is eleven feet one inch around. The two limbs aggregate thirteen feet eight inches. Nine years ago I measured the same tree. At its smallest part it measured nine feet six inches, and the limbs aggregated twelve feet six inches, showing a growth in the nine years of six inches girth of the body, and one foot two inches of the limbs.

The tallest tree now standing is sixty-seven feet, or, to be exact, sixty-six feet ten inches in height.

THE SETTLEMENT OF 1784.

In 1784 a large colony from Detroit settled on the Raisin; and in time the river for ten or twelve miles was settled, so that as the farms were narrow and the houses built on its banks, it was a continuous village on both sides. Around each house was a pear and apple orchard. It is interesting, in reading over the evidence upon which the United States confirmed the titles to these French settlers, to find the unanimity with which it is testified that a Navarre, a LaSalle, a Jerome, or a Robert, settled and occupied their land and planted an orchard before 1796, the date fixed by the act of Congress, from which

possessory rights were to constitute title. As in the olden time, he that builded a house must needs plant a vineyard, so here, no homestead was complete without its orchard of apples and pears. Vineyards they need not plant, as grapes were indigenous to the soil.

FOUR EPOCHS.

I find that there are four distinct and well marked epochs,—we will not call them generations,—of these apple and pear trees. By a careful examination and measurement of them we can almost place the trees in their appropriate epochs. As in the old Knickerbocker times spoken of by Washington Irving, the good nature and hospitality of the Dutch “vrows” were somewhat commensurate with the amplitude of their waists, and the acumen and profundity of the men were somewhat in proportion to their corporeal magnitude; so the importance and value of these old trees consist largely in what they may measure.

The average measure will nearly indicate the epoch in which they were planted. These epochs were as follows:

First, The year 1780, when the Navarre trees were planted;

Second, The period from about 1798 to just before the war of 1812;

Third, The period from just after the war, 1816 to 1820;

Fourth, From 1830 to about 1840;

Fifth, From about 1844 down to the present time; but as the last are of the modern, grafted kinds, they do not come within the scope of the present article

THE FIRST EPOCH

Substantially, as I have stated before, the pioneers were the Navarre trees. It is true, some had been brought from Detroit prior to 1800, and planted in other orchards, but they had not succeeded. Among them were the trees on the Labadie claim at “La Plaisance,” brought from the Labadie farm adjoining the Navarre homestead at “the straits,” but subsequently, as soon as it was found that the Navarre fruit was preferable, sprouts from the latter were substituted. One singular circumstance is, that all these trees came from the sprouts, not from seeds. Whether experience had demonstrated that seed plants were a failure or not, I have not been able to determine. I have learned from Robert F. Navarre that these trees, when young, sent out many sprouts from the roots.

THE SECOND EPOCH.

Among the trees that may be classed in the second epoch, from 1798 to 1810, are those planted in 1798 on the Jacques and Isidore Navarre farms. The pear tree now standing in Mr. Swop's yard, on the Isidore Navarre farm, set out in 1798, measures seven feet ten inches, and is partially dead, but bore eleven bushels of pears year before last. Two trees standing on what was formerly the Jacques Navarre farm, just at the Lake Shore Junction, were set out two years before Jacques, a younger brother of Francis Navarre, erected his cabin. In the chimney of the old house was a stone marked 1800, indicating the year when it was built. This correctly places these trees in the second epoch. They measure seven feet six inches and six feet four inches respectively.

On the Joseph Robert farm, just below the Canada Southern depot, stand six pear trees and four apple trees, set out about 1802. The pear trees measure from five feet six inches to seven feet in circumference. The apple trees measure six feet, seven feet, six feet seven inches, and nine feet two inches, respectively.

The Labadie orchard has been substantially destroyed by the encroaching waters of Lake Erie.

THE THIRD EPOCH.

Among the trees planted in the third epoch,—that is, after the war of 1812, on the return of the fugitives to their old homes and the ingress of settlers,—were those now standing in Judge Warner Wing's garden and I. E. Ilgenfritz's lot, just opposite, planted in 1816 by Col. Anderson, who, about that time, built his store, which is now standing just opposite Judge Wing's residence. These pear trees were brought from the Labadie farm, now submerged. It is supposed the large pear tree in Judge T. E. Wing's yard was planted about the same time, as that was Col. Anderson's residence after the war; but it may have been planted by him before the war, as he was a resident here at that time. In the same epoch may be classed the large pear trees on the old Downing place. So far as size is concerned, they would indicate an older life, as they measure eight feet four inches and six feet eight inches; but as they were set out by Stephen Downing, it must have been after the war. They have been constant and full bearers. Some eighteen or twenty years ago they seemed to be dying, but by a mere accident were saved, as it is supposed. Mr. Downing's people were in the habit of making ice cream frequently under them, and the salt used in making it was thrown out on the ground; this salt seems to have renewed their life, as they immediately became vigorous. On the Ives place are two pear trees belonging to the same epoch, set out by Jacques LaSalle. They measure six feet six inches and six feet four inches, respectively. Belonging to the same epoch were the trees set out on the Caldwell farm, some four miles up the river; also the tree in Mrs. Dr. Conant's yard, and the two on the farm of L. La Fountain, Esq.

THE FOURTH EPOCH.

Among those of the fourth epoch is the tree in the Macomb Street House yard,—those in the yards of Victor Vincent, Gen. Spalding, and many others in different parts of the city. The average size of them is about five and one-half feet in circumference. They are vigorous and prolific bearers. One—set out by Thomas Clark, Esq., in 1837,—needs particular mention, as being a grafted tree. It was procured from Norris Wadsworth, who then owned the Ives' place. It was grafted from scions obtained in Connecticut. It bore the next year after it was set out, and has borne every year since. It is called the Early Catharine, and ripens in early August.

THE OLD APPLE TREES.

I have a few notes not yet disposed of in reference to the old apple trees. On the farm of S. M. Bartlett, Esq., some five miles south of this city, are standing a few old apple trees, which, apparently, are of great age. One of their companion trees was blown over by a gale June 9, 1835. It was sound to the core. It was sawed off about the usual stump height, where it was two feet nine and a half inches in diameter. Mr. Bartlett counted 85 concentric rings, indicating an age, at that time, of 85 years; hence, at the present time, its companions must be 125 years old. To the question, whether the trees seem to have been set out in orchard fashion, he replied: "No; at least no more than the millers, which were two in a row, but never three." They were manifestly of Indian planting.

EIGHTY YEARS OLD.

n the farm now owned by George Wakefield, some seven miles up the river,

is a tree evidently set out some 80 years ago, as the evidence showed that there was an orchard there prior to 1796. It is seven feet eight inches in circumference, with an aggregate of limbs 19 feet 6 inches, and has an immense top, being 50 feet in diameter. In 1873 this tree bore 35 bushels of apples. It is 52 feet high.

A REMARKABLE TREE.

In the orchard of B. Dansard, Esq., by the former residence of Gov. McClelland, is an apple tree which is well worth seeing, and whose history is of some moment. It is ten feet in circumference six inches from the ground, and nine feet six inches four feet from the ground. There are four branches, which aggregate sixteen feet four inches in circumference. It was set out as early as 1781 or 1782, hence is over 90 years old. Robert F. Navarre well recollects as among his earliest memories, that there were at that place four or five trees, then some nine or ten inches in diameter, and apparently the same size of his father's, which were as old as the Navarre pear trees. This tree is as sound and as full of life to-day, apparently, as it ever was, and bears from fifteen to twenty-five bushels of fruit every year. In 1841 Gov. McClelland had it grafted by E. H. Reynolds, Esq., of this place, to Rhode Island greenings. Mr. Reynolds set some three hundred scions in it. All things considered, it is the most remarkable tree on the Raisin, taking into account its age, vigor, and the remarkable vitality which has enabled it to carry such an amount of grafts in its hale old age. Two years ago Mr. Dansard trimmed off some of the decayed limbs; they cut up into more than a cord of wood.

SIXTY YEARS OLD.

In the yard of Thomas Clark is an old apple tree, set out by Jacques Lasalle some sixty years ago. It is supposed that this and its companions were brought from Montreal, but of this I have my doubts, as it is manifest "the straits" had an abundant supply. A companion tree died a few years ago, but the year before its death bore seventy bushels of apples.

A YOUNG AND OLD ORCHARD.

In Judge Warner Wing's lot, as also in the lot of B. Dansard, stand several trees, set out in 1804 by Dr. Joseph Dozette. They are in prime condition. They range from five feet six inches to six feet eight inches in circumference. Their vigor is all the more wonderful, if it be true, as seems to be well authenticated, that the doctor, following a whim as astonishing to the old French settlers as to our modern horticulturists, cut off the roots, made a hole in the ground with a pointed stick, and drove the trees in, insisting that that was the way to set out trees. At any rate he succeeded in making good trees, however he may have set them out. This orchard, including, as it did, the lots now owned by Judge Wing and Messrs. Dansard and Ilgenfritz, will now show you what is a rare sight, namely: trees of all ages, from nearly 100 years old down to 10 years' growth, all in vigorous health and bearing. You will there see to-day the trees of all the ages and epochs I have spoken of,—those of 1780, of 1804, of 1816, of 1830, of 1840, and of the present generation. As one tree died, another one has been substituted.

SOME REFLECTIONS AND CONSIDERATIONS.

This orchard may perhaps be made the basis of a remark I desire to make, as a conclusion I have come to, in my researches. This orchard seems to have always belonged to parties who have taken care of their trees. If the same care had been taken of the other old orchards as has been of this, ninety-year-

old trees in a healthy, productive condition would have been found now in ten-fold numbers. Many of our old trees have for thirty or forty years been left at commons, or allowed to grow as they might, in neglect, partly from the fact that better fruit had been introduced, and that it would be cheaper to raise a new tree than to graft an old one. It is my deliberate opinion that, with such care as we now give to our orchards, these trees at 100 years of age would have been as productive as at any time of their life. How much of this vitality is to be ascribed to the soil and how much to the quality of the fruit, it is not in my province to determine. But while it is doubtless true that their longevity is not to be ascribed to the soil alone (though it is largely due to that, as I shall suggest hereafter), much of it should be charged to constitutional vitality; and it may be that our modern improved kinds will not make such a good record of life.

Our imported fruit may have a value more from the very name,—like that of the leg of the Irish captain mentioned by General Sherman in his Memoirs. The gallant captain had been so badly wounded that the surgeons talked seriously of amputation. Against this the captain protested loudly, for the reason that it would be a shame to cut off the leg; that it was a very valuable leg, *being an imported one*. So our fruit in these days may have an *imported* flavor, but at the expense of a shattered constitution.

THE FORCING PROCESS.

A motto of the olden time was to plant an orchard for your children to enjoy, not expecting to gather much yourself. In our times the generation of our fruit tree rarely exceeds that of man. Is it true that the forcing process of our times conflicts with the natural laws of life? Is fast growth in a tree, like fast living in a man, the sure prelude to early decrepitude? Is it true that the choicest flavor is acquired at the sacrifice of the life of the tree? How is it, that often in an orchard you see, on the last decaying branch, an apple, the last gift of expiring nature, that rivals the renowned golden apples of the Hesperides, as beautiful and as fleeting as the hectic glow on the cheek of dying beauty? As I have said before, is it not possible that we are getting quality at the expense of constitution? But I leave that question to be settled by those of you who are better fitted to discuss the subject than myself.

GOOD CONSTITUTIONS.

Of this, at least, I am assured; the old apple trees and pear trees of the Raisin had good constitutions. Whether it was because they came from good, long-lived, hardy stock, or because they have stood, grown, and drawn their life from the rich, deep soil of the Raisin valley, I seek not to solve. I am assured that their longevity and vigor is to be credited largely to the generous fostering of a generous soil; and a few remarks as to its characteristics may not come amiss.

CENTRAL MICHIGAN.

My home to manhood was in the central part of the State. I know full well, as a farmer's boy, what the soil of the geologic drift period is. I know full well what can be produced by the gravel and boulders that came down from the north in those huge glaciers, which rolled and pounded the rocks they had torn up as they started on their southern mission, till they dropped them, all polished and rounded, from their icy embrace. I have seen how their mighty waters winnowed out the earthen harvest, leaving here the boulder, there the gravel, and there the sand. I have seen where the turbid elements, charged with

alumina, have left a mantle of clay wherever the waters stood, depositing a rich inheritance for the tiller of the soil. I know and appreciate central Michigan to its full extent.

THE BED ROCK OF AGES.

But as you approach the head of Lake Erie, you find that nature has provided a different soil. I was twenty years of age before I saw a quarry. Now and then was to be seen a little pocket of limestone. But the conception that there were places within fifty miles of where I lived, that you could go down to the foundation of the universe and quarry the rocks that were lying here before the glaciers brought down their rich freight and left it as a winrow along the center of our rich peninsula, never crossed my mind. That there was a region fifteen miles wide by fifty miles long, within twenty-five miles of my home, which the river Raisin nearly bisected, where there was hardly a boulder or gravel pit, and which was productive soil from the surface of the ground to the underlying rock,—soil that needed neither plaster nor artificial fertilizers to give the diligent farmer a suitable response to his toil,—that there was such a region was a surprise indeed, when I found it.

A MINERAL AND VEGETABLE SOIL.

This whole region is, manifestly, not the product of the drift period, or at least only partially so. It is true the glaciers passed over it, as is manifest from the *striae* on the rocks at Stoney Point and Pointe de Peaux. But their heavy deposits seem to have been carried further to the southwest, leaving the original rocks comparatively bare; and when the more quiet waters came, there was deposited a soil from three to twenty-five feet deep, made up of clay, sand, and particles of lime, and so generous in all the elements of vegetable sustenance, ready for immediate absorption, that, from surface to rock, the roots of the mightiest tree or the tiniest flower might grow to the fullness of its nature. The soil is not like the prairie,—deep in vegetable mould,—which has accumulated by centuries of growth and centuries of decay, but it is made up of this vegetable mould, combined with all the mineral substances which so largely enter into the product of vegetable life. You may dig a well to the rock and throw up the earth from its bottom layer, and the next season raise as fine a crop of corn as ever gladdened the eyes of the farmer.

THE RAISIN VALLEY.

Now this is the soil in which, and these the conditions under which the old pear and apple trees were produced. It is a conceit of the Raisin valley that this soil, so rich and so strong, so permanent in its character and so inexhaustible in its resources, is the best calculated for a hardy fruit tree; that it will produce a cleaner grain, a hardier fiber and more actual vitality than lighter or different soils. At any rate, such is becoming the settled conviction of our fruit growers.

So, as the old pear and apple trees seem to indicate by their thriftiness that we have a soil that gives a hardy constitution to the tree, we have an abiding assurance that to this constitution we shall, as time passes on, add quality, as experience may suggest, and that, with intelligent culture, assisted by the modifying and mollifying breezes of Lake Erie, we shall eventually make the valley of the Raisin the garden of Michigan.

POMOLOGY AND METEOROLOGY.

ADDRESS DELIVERED AT THE MONROE MEETING OF THE STATE POMOLOGICAL SOCIETY BY GEORGE PARMELEE, PRESIDENT OF THE SOCIETY.

GENTLEMEN:—I have allowed this subject to be announced for me, not with the intention of entering fully into a consideration of either branch of it singly, but to show only enough of the facts relating to the connection of the two to awaken, if I can, an interest among the members sufficient to lead to a constant and careful observation of the phenomena which we meet in our experience.

METEOROLOGICAL MYSTERIES.

There is no branch of physical science which is less explored or in which more things remain a mystery than in the varying conditions of the atmosphere, and the relation of those changing conditions to the general economy of nature.

Why one winter should be colder than another while the earth is making similar revolutions around the supposed source of heat; why the storms of winter begin a month earlier one year than they do some other year; why we have equally as great difference in the approach of different springs; why some summers are long and hot and others short and cool; why some are so rainy that little but grass can grow, and again they are so dry that vegetation hardly survives; why the orange trees were all killed by cold weather in Florida in 1835, while in the Northwest the winter was characterized by no such severity; why we have just passed the coldest on record, while Florida has been enjoying her usual mildness; why Southern Italy has, in some winters, very unusual cold, while Northern Europe has a comparatively mild winter; why some of our winters are little else than a succession of cyclonic storms, and others are noted for the even tenor of the winds; why some summers and autumns are the delight of steamboat men for their freedom from sudden and high winds, and others are the exact reverse, and accidents and losses characterize the season; why the air of a clear day is sometimes charged or saturated with moisture, and on another apparently similar day the air is taking up moisture from everything which can part with it: these are a few of the questions in which science aids but little; we will only venture one thought in relation to them.

They are not the result of caprice in the forces of nature, but the outcome of laws as orderly and wise as those which govern the motions of the planets,

and are as necessary in the order of nature as is the motion of the earth or the light of the sun. The words of the poet are good philosophy to-day:

“All are but parts of one stupendous whole,
Whose body nature is, and God the soul.”

THE MYSTERIES OF PLANT GROWTH.

The unexplained phenomena are by no means confined to the meteorological side of the subject. The mysteries of Nature's ways in the processes of rearing up organic forms are no less numerous.

In pomology we are constantly met by problems which we cannot solve. Our successes and our losses are connected more or less with causes which are unexplained; a winter freeze, an untimely frost, a drought, a wind, have all brought us their losses. These accidents, as we call them, seem to be easily traced to the cause, while other losses are not so easily traced. The derangement in the structure and in the functions of the leaves, resulting in the failure to form blossom buds for the next season; the appearance and spread of rot on the ripening cherries, grapes and peaches, and its sometimes sudden arrest, the appearance of mildew and attacks of pear blight, are not so open to an unhesitating conclusion as to their cause.

COINCIDENCES.

While we are surrounded by mysteries which we may not solve, we do, by noting coincidences, get many practical facts of value to our calling. But these coincidences often mislead us: thus, on a frosty morning we see, as the sun comes out with power, some of our flowers or tender fruit germs perish; we say the frost did it because it is coincident with it, but in the occurrence of frosts at same degree of freezing, but with different degrees of the succeeding sunlight or heat, we find results to differ, and we next infer that it is warming, and not freezing, which does the mischief.

We find, when an untimely freeze puts our tender plants in jeopardy, that if followed by fog or by cloudiness, and the temperature is raised but slowly, our tender plants may remain unhurt. Apples, in autumn, may freeze on the trees so as to rattle like stones when struck together; but if the sky is cloudy and the weather moderates very slowly, the keeping quality of those frozen apples is not perceptibly hurt.

We need not despise the lessons from coincidences though we are still hedged in by mysteries.

FUNGOID GROWTH.

It has been an easy way to explain the occurrence of grape, cherry, and peach-rot, and of mildew of vines, and of pear blight, by charging all to attacks of fungoid growths, without stopping to consider that the atmosphere is, ordinarily, full of their spores, and that all growth must go to swift destruction if the attacks of spores do not require a previous morbid condition of the living organism. If they do, that morbid condition is the disease, and the fungus only the result. To call the fungus the disease is just as reasonable as to call the worms of the dust the cause of our demise.

We find fungus a coincident of rot, but that is not proof that it is the cause.

There are atmospheric coincidents of value in considering the drawbacks which Pomologists encounter.

BAROMETRIC OBSERVATIONS.

About eighteen years ago I resorted to barometric observations to enable me to forestall, if possible, the sometimes very rapidly ripening of peaches without

any apparent unusual conditions of temperature or moisture. These observations were continued through many years, and with a perfect uniformity of coincidence between the barometric pressure and certain observed phenomena.

When peaches were at the ripening stage, the occurrence of low atmospheric pressure always accelerated the ripening process, while a rise of mercury as uniformly retarded it. As a practical use of the fact, I learned to secure extra help when the mercury was running low; and the help was always needed.

On the other hand, when weather was fine and peaches showing by the color that they were on the verge of ripeness, if mercury was high and steady, I was slow to put on help. I had occasional attacks of peach-rot, and sometimes of grape-rot, but they were always at times of decidedly low pressure, and the spread of it as surely ceased, in every instance, when mercury went above ordinary fair weather stage.

THESE COINCIDENCES

should lead to no positive conclusions, for rot did not always appear at all times of low pressure; other conditions seemed also to be necessary, as it did not seem disposed to appear unless there was nearly the ordinary amount of moisture in the soil; and it was rarely seen in orchards but little cultivated. At places much farther south, I understand that orchards standing in grass do not seem to be saved from rot when it prevails.

THE DERANGEMENT OF THE FOLIAGE

of apple trees, which is sometimes seen in summer, seems to be a serious matter as affecting the setting of buds for the next year's crop, and may, possibly, be traced to an atmospheric origin. This derangement is often unnoticed, but is easily seen by turning the leaf up to strong light, thus showing the patches of pale green or yellow.

I am unable to say whether the occurrence of this malady is sudden, and have only given it attention during the last few summers. Yet I think I see some coincidences which, though they may not be of great value, I mention to excite interest in the matter, hoping we may have some more decisive observations; for the unhealthy foliage is, of itself, a thing of importance.

In a season of its prevalence I found, in a pretty full canvass of the town in which I live, that it seemed to be worst on good soils with what we call good cultivation.

Altitude, apparently, had nothing to do with it, nor did shelter from prevailing winds.

The question arose in my mind whether we ought, on good soils in good condition, to stir the ground at those times when it would result, to ordinary crops, in the greatest amount of growth.

These coincidences, though leading us to many points where our knowledge stops, as I said, must not be despised, for out of the knowledge of them much practical good has arisen. The derangement in the leaves of grape vines which show patches of discoloration may be akin to the unhealthy state of apple leaves referred to, and it is quite clear that best results are not reached under the influence of either malady.

VINEYARD PHENOMENA.

A fact of interest is shown in the coincidences of circumstances among the very celebrated vineyards of Europe, though, in distance, they are widely separated. These coincidences are everywhere very poor soil,—though dissimilar in composition,—and open, airy exposure. In treatment of vines there is

another uniformity which is this: very slight or no manuring. On this subject I will quote a few passages from the report of our committee on the culture and products of the vine, to the United States commission at the Exposition of Paris, page 165 Report Department of Agriculture, 1867:

"The soil of Medoc, where stand the 'Chateau Margeaux,' 'Chateau La Fitte,' and 'Chateau La Tour,' is a bed of coarse gravel, among whose pebbles the eye can barely detect soil enough to support the lowest form of vegetable life. In the vicinity of Beziers, on the other hand, the land is rich and strong enough to yield any kind of a crop; yet Medoc grows wine that often sells for ten dollars per gallon, while that of Beziers sometimes sells for the half of ten cents per gallon. In Burgundy there is a long hill on whose dark red, ferruginous limestone sides a wretchedly thin coating of earth lies, like the coat of a beggar, revealing, not hiding the nakedness beneath. Here stand little starveling vines, very slender and very low; yet here is the celebrated 'Clos Vangert,' and this is the hill and these are the vines that yield a wine rivalling in excellence and value that of Medoc, and, to the fortunate proprietor, the *Cote d'or* is what it signifies, 'a hillside of gold.' At its base spreads out a wide and very fertile plain, covered with luxuriant vines whose juice sells at from ten to twenty cents per gallon.

"If you go further northward and examine the hills of Champagne, you will find them to be merely hills of chalk; and these instances only illustrate the rule derived, not from them alone, but from abundance of others, that for good wine you must go to a dry and meagre soil. Yet we would be sorry to have to extend the rule and say the poorer the soil the better the wine, for there are certainly very few patches of ground in America that can match in poverty the mountains of Champagne, the hills of Burgundy or the slopes of Medoc; nor would it do to conclude that manure should not be applied, for, although some say it is hurtful to the wine in its quality, it is yet an open question whether this is so or not. Meanwhile, the practice is to manure, though sparingly."

In wine districts generally there is great difference in the quality of the products of different seasons.

Between the apples of different years there is a difference in flavor and keeping quality which may, probably, be traced to different conditions of heat, moisture, or prevailing winds.

THE QUESTION OF WIND-BREAKS

or open exposure needs to be settled by the test of experience. Are the successful orchards open to the winds, or sheltered? If the exposed orchards are most successful, and I think we must concede that they are, is it owing to the exposure to wind? Coincidence of success and open exposure might say so, but it may be found at fault. There are places where the prevailing winds are so concentrated by the reflection of hill and forest as to generally prevent the pollen from rendering the ovule fertile, though the blossoms appear to open with all the organs perfect, and the tender leaves of fast-growing pear trees in bleak places are often injured by a high wind.

In this State the more exposed orchards are on elevations with adjacent lower levels; and where they are without surroundings to specially concentrate the winds upon them, we will, I think, find them usually more productive.

If we can understand all of the coincidences it will be safe to form opinions; but the fact that we are constantly reaching new truths in nature teaches us to look upon common things as probably hiding something which we ought

to know; and, while our practical work is connected with mysteries, if we believe in progress we must let no fact escape us.

THE VALUE OF PROTECTION.

The general idea of the value of protection from prevailing winds may be correct when considered by itself, but there are facts to be observed in connection with the airy locations which may have very much to do in accounting for their productiveness.

VALLEYS

reach a higher temperature under a midday sun than adjacent hills, and, on the contrary, at night they are found to be cooler, giving a wider alternation between day and night temperature; and, if evenness of temperature is an advantage, by promoting a more steady growth or in any other way, then the hills have the advantage.

THE PRESENT YEAR, 1875,

abounds in useful lessons to us, and especially does it show us a difference between hill and valley as regards the occurrence of extreme cold and the effect upon our trees. It has been a popular idea that, as mountain tops are cold, hills, too, must be colder than the plains, and, in average temperature, they probably are; yet, as affecting the wintering of tender fruits, we find the hills have the advantage. It is not the average cold but extreme cold which hurts our trees, and, at times of stillness, the air out of doors obeys the same law that it does in a closed room.

THERMOMETRICAL EXPERIMENTS.

Many years ago I commenced a series of thermometrical experiments at two points on my farm, which were about sixty rods apart,—the one point a knoll, the other a swale; the first being about thirty feet higher than the latter. The experiments were at times of very little or no wind. The least difference found was 3°, the greatest 11°. At one time of protracted and apparently perfect stillness, a difference of 27° was found between a wide and deep valley and the hill tops on each side, as indicated by one thermometer on each hill and two in the valley. On one of the still nights of the past winter, on taking two thermometers a short distance into a slight hollow, mercury went down 9°, and on carrying them to the crown of a ridge which formed a side of the same hollow, and only a stone's throw distant, the mercury rose 8°, while the altitude was only eleven feet more, making about a degree in temperature for a foot and a half in height. The instruments were then taken into a deep hollow about eighty rods distant, when the mercury sunk 23°. In the last instance, the difference in elevation was about one hundred and fifty feet.

THE EFFECTS

of the past very cold winter are seen to correspond somewhat with the thermometric indications where rows of tender varieties extend from hills down into hollows; and trees which were heavily pruned last season appear, in many cases, to suffer as badly as those in hollows.

On the approach of spring, when injury to bark of apple trees was found, it seemed to be, as a rule, on the southerly side; and we have been in the habit of calling such cases *sun scald*. But I have seen, in a number of pear orchards

a kind of injury similar in appearance, which was as uniformly on the *north* side. Shall we call that sun scald, too? If so, will not whitewashing in the fall, by reflecting more of the heat, help us out of such difficulties?

We find, in the case of some tender varieties, a difference in the amount of injury which is not traceable to difference in temperature,—where altitude, configuration of the surface, and apparently the character of the soil were the same; and this difference is equal to that between perfect health and death. In these cases we find a difference in the cultivation on the previous year.

CONCLUDING REMARKS.

Each season brings its lessons, and as practical men we cannot afford to be careless of our opportunities. There is, perhaps, not a thing in our business of which we do not need to know more. If we will note events carefully and mass our experience, we may all be wiser.

OUR FRIENDS—THE MOLE, THE TOAD, AND THE SPIDER.

A PAPER WRITTEN FOR THE SUMMER MEETING OF THE STATE POMOLOGICAL SOCIETY, BY EDWARD DORSCH, M. D., OF MONROE, MICH., AND READ BY PROF. BOYD.

GENTLEMEN OF THE STATE POMOLOGICAL SOCIETY:—If Mr. Bergh, at New York, has the mission to protect our quadruped friends, the horse and the dog, allow me to-day to speak to you a few words for the protection of some of our friends in the animal kingdom which prejudice and superstition have considered a long time our enemies, viz., the mole, the shrew and the hedgehog, the owl and the chicken-hawk, the toad and the spider.

THE MOLE.

Many of our farmers feel great satisfaction if their spade kills a harmless mole, whose only crime is the little hill of earth he raises in our meadows when he goes upon his underground hunting expeditions, and which can be flattened again by the foot of the farmer before it hinders the motion of the scythe or the mowing machine.

Nature has given us the mole as a never-tiring destroyer of all kinds of grubs, worms, larvæ and other vermin which feed on the roots of our grass, our grain-bearing plants and fruit trees, and at a place where we cannot follow him. Nature has given him such a tremendous appetite that he dies if he has nothing to eat for six hours, and his only food is meat, as far as worms and insects furnish it. Hundreds of moles have been dissected and their stomachs examined, but not the least vegetable fiber was ever found except it was brought to it by the devoured insects. Experiments have shown that in case of want the mole eats up his kind and own family rather than touch any vegetable. I know very well that the eyes of the lady will fill with angry tears if she finds during her morning walk a few of her pet plants almost dying, on account of the burrowing of a criminal mole which selected her rosebeds as its hunting grounds, and threw up his hill next to her best geranium or heliotrope. But if the fair lady would reason a little she would tender the gray culprit a hearty forgiveness, and thank him for the extinction of the restless enemies who feed upon the roots of her cherished plants, and she would press down the earth again and water the injured flowers, which will afterwards grow so much the better because the ground has been loosened.

Prizes have been paid in former times by stupid communities in the old country for every mole caught; men have spent time and money in catching this benefactor of mankind, only to find themselves punished for their ignorance by being overrun with bugs and beetles, crickets and caterpillars. Nevertheless our boys are allowed yet to torment and kill this inoffensive but slandered vermin hunter. But the time will come when his virtues will be recognized, as it has arrived already for

THE TOAD,

for which English gardeners pay now with pleasure four shillings apiece, to set them as guards against snails and bugs in their salad beds, after having found out the good services they do. What horrid tales has superstition not told about this harmless Batrachian? Its bite is poisonous, has been said. Who ever was bitten by a toad? Its jaws have no teeth, no sharp horny edges like the turtle's. "But," says an old wiseacre, who has seen it in a school-book of 1701, "if it can't bite, its saliva (its urine), the juice oozing out from the warts on its back, are poisonous." Natural science of to-day denies it. The toad has as little saliva as the frog, hardly enough to keep its tongue moistened, which always is sticky and clammy to glue on it the insects it catches. Its urine is not more acrid than that of the turtle, and the slime oozing out of the warts may cause perhaps a reddening of the skin, but will poison nobody. When the cool evening draws the dark cloak of night over the face of the earth, the toad emerges from his moist resting place and begins to look for snails, flies and bugs. Slowly it creeps forward, and narrow is the region of its hunting grounds, but it goes systematically and thoroughly, knowing the "nest-hiding" places of spider and slug, as a worthy member of the order of St. Hubertus.

THE SHREW.

The shrew—but not the shrew tamed by Shakspeare—is an animal of similar temperament as the mole, and does us the same services above ground which the mole does below. The caterpillar, the larvæ and chrysalis of the butterfly, the worm and the centipede have no fiercer enemy than the shrew, which sacrifices young mice by the dozen to the hungry Moloch of its stomach. A kind of musky smell may have caused the bad stories which are told about this little fellow. People say that its bite is injurious to man and beast; but its teeth are not long enough to scratch the skin of a horse, and its touch is harmless.

THE BAT.

What mole and shrew accomplish against the larvæ, the bat does against the full-grown insect which roams through the air. Evening and night are enlivened by its flight, and there is no need of fear that it may bury itself in the fair locks of the ladies, if by accident it should fly into the parlor attracted by the glaring lamp. Hair, free of insects, will not be invaded by the bat.

THE HEDGEHOG.

But particularly the hedgehog, or urchin, ought to be recommended to the protection of our farmers. Having slept through the whole winter, the hedgehog takes the shady fence corners and cool groves for its abode, where he lies in wait for the wily snake, all kinds of worms, and mainly field mice. If it would not smell so disagreeably and would not make so much noise by his clumsy hunting, it would be preferable to cats as a destroyer of mice. But in

the barns and stables it makes a formidable domestic animal of the greatest utility. It seems to be poison-proof. Experiments have shown that the bites of poisonous snakes do not affect it, and with impunity can it make a stout meal of Spanish flies, which are detested by any other insectivorous animal.

THE CHICKEN-HAWK AND THE OWL.

Among the birds I will only select the chicken-hawk and the owl, which are yet persecuted. That our singing birds are to be protected against Sunday hunters and boys who destroy their nests, has been acknowledged at least by the present generation, and our law-makers have tried to prevent their destruction. But the chicken-hawk and the owl, particularly the little barn owl, suffer yet from the envy of man, because they catch in time of need a young rabbit or partridge, perhaps a pet chicken of the worthy housewife. Oh, do not become excited about such a misdeed! Hunger is a fearful disease, and makes man forget all the laws of civilization. Greater, a thousand times greater is the benefit man derives from the buzzard and owl by their catching of mice, rats and larger insects. Yea, the turkey buzzard is a better scavenger and health officer than the most of these highly paid officers in our southern cities. Last summer one of them was carried to Monroe, probably by the scent of our dirty alleys, and I am sorry to say that he fell a victim before the guns of our hunting fraternity, who took him for a turkey, and "smelled the rat" only after taking him up.

THE OWL.

The owl is hated by most of our population, because it flies at night, screams in an abominable key, and has always been considered as a bird of bad omen by the ancients. It is believed to be a messenger of death, because it frequently calls at a lighted window, and the night-lamp burns only in the country in the sick-room.

It is very probable that sometimes a person has died at whose window an owl screeched the night before, and superstitions brought death and owl in connection. But it is one of our benefactors. It catches the great night-flying beetles and sphinxes; and one pair of owls brought in one night eleven mice to the nest for their young. Blessed, therefore, is the region where the owls are many, because they are cats on wings, bent on destruction of the enemies of our grain and our victuals; but at present the cat is loved, is allowed to sleep upon the softest rugs, and sometimes in the bed of its mistress,—and the cat on wings is killed whenever it shows its round face in daytime!

THE SPIDER.

At last let me speak a few words for one of the ugliest members of the animal kingdom, the spider. In relation to character a worse individual could hardly be pointed out. Our fiercest "women-righters" do not hate the oppressing sex to such a degree that they would eat up their lovers, for the largest portion are "women-righters" because they did not find lovers to make them forget their rights. But the female spider, a spiteful creature, often eats up its lover for various reasons. But, nevertheless, man and woman ought to spare the spider, because it diminishes by net and hunting the pest of our homes during the summer, the fly and the mosquito. House-cleaning means, above all, the destruction of the waving nets which this teacher of our weavers appends for the careless fly, but half a day is sufficient to replace the fine fabric to the grief of our cleanly ladies. Do not detest the spider too much! Its mission is to hold

in check the multiplying of flies, whose mission in the great household of nature is the absorption of all the offal and garbage, of all the rotting and decaying animal and vegetable matter. Nature is not governed by love, as we see everywhere, but by hate in so far as one eats up the other; and if we try by antipathy to meddle with this rule, if we destroy some of the destroyers, we do ourselves the greatest injury. By the loss of our harvests we were compelled to learn wisdom, and if we have become wise at last, we conquer our antipathy to certain creatures and teach our youth the great diplomatic axiom, "*Laissez faire!*"

SPRING LAKE--1874.

EXTRACTS FROM THE FRUIT REPORT FOR SPRING LAKE, READ BY
CHARLES E. SOULE, ESQ., AT THE OCTOBER MEETING OF THE
STATE POMOLOGICAL SOCIETY.

MR. PRESIDENT AND GENTLEMEN:—The year 1874 has been by far the most cheering and successful year the fruit growers of Spring Lake and vicinity have known since attention has been largely drawn toward this branch of husbandry.

PEACHES,

which constitute our principal crop here, yielded largely, have been the finest in quality, and have sold at the most remunerative prices that growers have known since the early days when the lack of supply made the demand such as to obtain fancy prices to the grower.

THE DROUTH.

It is true indeed, that the drouth, which so completely ruined the berry crop, shortened the yield and injured the quality of the Hale's Early and Early York in many cases, but I have in mind a neighbor's crop of Hale's Early which I helped to harvest, that in yield, in size of fruit, and in the beauty of bloom that distinguishes this popular but ephemeral variety, I have not seen equalled since our lake has been the peach man's home. But this peculiar excellence was owing to radical thinning, to good cultivation and judicious enrichment, rather than peculiarity of soil or season.

OPPORTUNE RAIN

brought the Barnards and Early Crawfords along in their season, in the greatest quantities and excellence we had ever known.

THE EARLY CRAWFORD.

The Early Crawford is probably the most extensively grown of any single variety in this locality. My estimate is made from some careful computations of crops raised by the large growers, and I judge that upwards of 25,000 baskets of Early Crawfords were shipped from the town of Spring Lake during the month of September. The Hale's Early, the Barnard, the Old Mixon Free, and Hill's Chili, have been since 1869 and 1870 extensively planted, but they do not yet severally reach the yield of Early Crawford's planted in 1866, 1867, and 1868.

This bountiful season all varieties have yielded largely,—the Hales, the Yorks, the Barnards, the Crawfords, the Old Mixons, Hill's Chili, and Smock. As a general thing, I think the Early Crawford has been the finest peach, has given the pomologist the most exquisite æsthetic delight in its mammoth proportions, its gorgeous damask cheek, melting into the lovely yellow of its skin like the purple cloud tinged with the radiance that beautifies a summer sunset, while its flavor, coveted by the epicure, makes it the queen of the market.

But notwithstanding all this, the Early Crawford is not now planted, I may say, at all in this locality. It is not a regular annual bearer, it is not an early bearer, it is not a large yielder, for which reason I predict that five years hence the Early Crawford will be low in the list of peaches as to amount produced.

THE BARNARD.

I need not here say that I stand by my old hobby, the Early Barnard. It is not all that the Crawford is, but it is all these things that the Crawford is not. By *careful thinning* my Barnards sold in the same market, at the same time, as well as my Crawfords, and yielded much higher to the tree.

WANTED.

We need other varieties when we can get the right ones. We want a reliable and popular peach in place of the Yorks, and a good bearer and a hardy tree in place of the Jacques Rareripe, these varieties filling the vacant market between the Hale's Early and the Crawfords, and between the Crawfords and Hill's Chili.

THE SMOCK.

Perhaps the most profitable peach this year has been the Smock, but our remarkable exemption from frost this season is the occasion, and they ripen too late to recommend.

IMPORTANCE OF THINNING THE FRUIT.

I have not made any general inquiry, but my judgment is, from the sale of my own and some of my neighbors' crops, that peaches, when well cultivated on good soil, and well thinned, brought about fifty cents a basket in the basket on the farm, which is nearly \$2 per bushel. Very many crops brought less, but only in cases where the want of thrifty and good culture was manifested. This season has demonstrated the necessity of *thinning* all varieties except the Early Crawford. In most cases the heavy bearing varieties when not thinned were worthless.

GRAPES.

Grapes, as usual, have been a heavy crop; how profitable I am unable to say. The Concord still merits its sobriquet given by Horace Greeley,—“the grape for the million.” It seems absolutely hardy, free from disease and from ravages of insects.

The Delaware, as in most other localities, is in rapid decadence here. Blight and the ravages of the thrip, a little fly which sucks the sap from the leaves, have prevented, I dare say, one half of the Delawares from ripening, and their value in the market has been destroyed. Young vines seem to bear good fruit, but vineyards in years are nearly or quite ruined. We await a suggested remedy.

EXPERIMENTS

I have not tried, except in a single case, which failed so ignominiously that I shall not mention it here.

My neighbor, Mr. D. G. Alston, whose fine crop of Hale's Early I have before mentioned, applied half a pound of potash, procured from an ashery in Ionia county, at a cost of eight cents per pound, to each tree upon a sandy ridge where the sand had drifted badly, and harvested as fine peaches from the trees as I have ever seen of the variety; whereas upon similar situations without the potash I have this year seen Hale's Early not worth the freight to ship them to market. The potash was applied by dissolving in water, and applying to the surface in the fall.

APPLES.

The codling moth has destroyed the apples in Spring Lake and in Ottawa county, so far as my observation has extended. A remedy must be discovered and used, or our choice winter fruit will only be fit for feeding swine. A perfect winter apple is the rare exception, while one honeycombed with worm-holes is the rule.

We look anxiously for a remedy against this insect and the thrip that destroys our hitherto unexcelled Delaware.

MARKET AND MARKETING.

Our systems of marketing have been as various as the disposition of the men engaged in our calling.

My own experience is that the most satisfactory results are obtained by putting up good fruit in a neat and tasteful manner, and shipping steadily to the same commission merchant, when those have been found to merit confidence.

Out of over 4,000 packages shipped by me, a single commission house in Milwaukee has sold about 2,000; and these sales have been uniformly higher, and much more satisfactory than the new men we have occasionally tried.

DISCUSSIONS OF THE MANISTEE HORTICULTURAL SOCIETY.

REPORTED BY APP. M. SMITH, SECRETARY, AND PUBLISHER OF THE
MANISTEE TIMES.

The Manistee Horticultural Society was organized on the 25th of January, 1875, but the permanent officers were not elected until March 22d. The following are the officers:

President—Dr. L. S. Ellis.

Vice President—J. G. Ramsdell.

Secretary—App. M. Smith.

Treasurer—R. G. Peters.

Librarian—Edwin Russell.

Directors—T. J. Ramsdell, John W. Allen, Charles Hurd, O. A. Wheeler, D. W. Mapes, and the President and Secretary, *ex officio*.

The object of the society is to promote the pomological and horticultural interests of Manistee and adjoining counties, as will be seen by the following

CONSTITUTION.

ARTICLE 1. The terms of membership of this Society shall be, subscription to its constitution and the payment of one dollar annually, the first payment to be made on admission, and subsequent payments at the annual meeting; and no person shall be entitled to the privileges of membership while his annual tax remains unpaid. The payment of ten dollars at one time shall constitute the person so paying a member for life.

ART. 2. The officers of this society shall be a President, Vice President, Secretary, a Treasurer, a Librarian, and five Directors, who shall be chosen annually by ballot on the first Monday in January.

ART. 3. The duty of the President shall be to preside at all meetings of the society; and he shall also be *ex officio* chairman of the executive committee.

ART. 4. The duties of the Vice President shall be to preside at all meetings in the absence of the President.

ART. 5. The duties of the Secretary shall be to keep a record of the proceedings of the society, and of the executive committee, of which he shall be one, and do the correspondence of the society.

ART. 6. The duties of the Treasurer shall be to keep the funds of the society, and make disbursements according to the rules and orders of the society, and make a full report of all the receipts and disbursements, at the annual meeting.

ART. 7. The duties of the Librarian shall be to procure all necessary and useful books, that shall be ordered by the society, and to keep the same subject to the rules that may be prescribed by the executive committee.

ART. 8. The executive committee shall consist of the President, Secretary, and five Directors. The committee shall determine for what articles premiums shall be offered, and

the amount of such premiums, and they shall appoint all the standing committees. They shall also constitute the committee of Finance. They shall have power to call meetings of the society at such time and place as they shall deem proper. They shall also prepare such by-laws and regulations as they shall deem necessary, subject to the approval of the society, and call a meeting of the society as often as once a month during the year.

ART. 9. The constitution may be altered or amended at any regular meeting of the society by a two-thirds vote of the members present, notice having been given one month previous.

DISCUSSIONS.

HOW DEEP TO PLANT TREES.

The Manistee Horticultural Society held a meeting at the office of Dr. Ellis, over the post-office, last Monday evening.

Mr. Mapes exhibited a collection of sprigs which he had cut from the plum trees in the Risdon orchard, which showed that the trees had borne the recent severe winter without any injury whatever. This exhibition of the hardihood of the plum, and its ability to flourish in this climate, gives renewed hope to the members of the society.

The society then proceeded to discuss the planting of apples and plums.

Mr. Parmaltee's theory of planting near the surface was referred to.

Mr. Mapes would plant from three to six inches deeper on sand than on heavy soil, because the wind had a tendency to blow the sand away from the roots and form an eddy at the foot of the tree.

Mr. J. G. Ramsdell said if he had to take either extreme in planting he would plant shallow rather than deep, though the soil was so light the tree would need propping.

Mr. Hurd held the same view. He thought it would be better, if the tree would stand, to plant only two inches below ground. He thought the roots flourished from the sunshine, and the gases absorbed from the air by the earth around the trees. What was charcoal placed around trees for? For nothing except its absorbing quality. It takes up the ammonia from the air and holds it to the roots.

Mr. Mapes cited cases where he had the bark scalded and trees killed by setting deep.

Mr. Russell cited the fact, also, that the soil in this vicinity was not as good deep down as near the surface.

Mr. Ramsdell said he wouldn't plant an inch deeper than the ground was worked on heavy soil, because water collected around the roots.

Mr. Russell said he had had the same experience with shrubs.

Mr. Booth said he had discovered the same difficulty in setting below the worked soil.

Mr. Ramsdell said he thought from three to four inches deeper than the trees were in the nursery was deep enough for apples and plum trees on all ordinary occasions.

Dr. Ellis asked if it made any difference which way the long root was set.

Mr. Russell said the northeast side of a tree in this vicinity was always the heaviest owing to the direction of the wind, and he thought the long root ought to be set in an opposite direction, say southwest.

Mr. Hurd said some held that the root should be put on the heavy side as a brace.

Mr. Ramsdell would set the long root on the southwest side. It would induce more growth on that side.

Dr. Ellis thought he would always set a little to the southwest.

In regard to the work of setting, the society concluded that to wet the roots and sprinkle earth on them was a better way than to pour water around them just after they were set out, because it washed the dirt away from the roots and left a hollow there.

Mr. Hurd thought that many trees had been killed by laying them down by the hole and not setting immediately. He would dig the hole, bring the trees out, and put right in.

In regard to distance, the society concluded that fifteen or sixteen feet apart was right to set all kinds of apple and plum trees.

In regard to varieties for market the Lombard ranked first and the Canada Egg next. Mr. Hurd said he had read a great deal about the Canada Egg and was satisfied it was the coming plum.

Mr. Ramsdell said it was the best to market, and it had a thick skin and was very large.

Mr. Rapes, in giving his experience with plums, said he found a great many who liked the German prune.

Messrs. Hurd and Ramsdell thought it was the poorest plum we have.

Mr. Rapes thought the Washington had a fine flavor.

Mr. Ramsdell said so far as that was concerned they would all have to knock under to the little Green Gage.

The society then decided upon the following best varieties in the order in which they are named: Lombard, Canada Egg, Imperial Gage, Duane's Purple, Yellow Gage, and Washington.

In planting 100 trees the society unanimously agreed that they would plant one-half Lombard, a large proportion of the other half Canada Egg, and the balance of most any other variety named above as among the best.

The society then resolved to continue the apple and plum question until the next Monday night at the same place, after which they adjourned.

THE STRAWBERRY.

A very interesting meeting of the Manistee Horticultural Society was held at the Times office, the principal part of the meeting being devoted to a discussion of the question, "What are the four best varieties of strawberries for market purposes?"

Mr. D. W. Rapes named the Wilson as the best, and Jucunda as the next best in his experience. He thought the Jucunda was not so prolific as the Wilson, but it was large and handsome and came in after the Wilson and sold higher. He had sold them for twenty-five cents per quart very readily, when he only got from fifteen to eighteen cents for others. Of other varieties he did not know so much from his own experience. He knew, however, of some good points in the Agriculturist, the Kentucky, and the Green Prolific, but his experience with them was not extensive enough to give him a definite idea of their relative value for market purposes. The Agriculturist, as far as he had tested it, did best in wet seasons. It grew to a very large size, was prolific, and a good berry generally, but it wouldn't stand the drought as the Wilson did.

Mr. Charles Hurd said the Wilson berry, besides being very prolific, was

adapted to any soil—it would grow anywhere. He hadn't tried the Jucunda sufficient to form an opinion as to its value. The Green Prolific, he claimed, would grow well on either clay soil or sand. It was a very large, fine berry, with a beautiful color, and kept a better flavor when taken to market. It was much sweeter than the Wilson. He had them both, and generally thought they sold well when mixed. When the Wilson began to get small, the Green Prolific came in large and nice. He could pick the Green Prolific twice as fast as the Wilson. They had a small stem which would snap off the bush when picked and remain on the berry, which was, he thought, very essential in berries that are picked for market. His experience had been that the Green Prolific would outgrow the Wilson year after year.

Mr. Edwin Russell conceded that the Wilson was best for general purposes, but for eating it was sour and had a peculiar acid taste, which he didn't like as well as the taste of the Agriculturist; but he was satisfied the Wilson was the first berry for market purposes. His experience had taught him that it was hardy and would stand more than any other berry.

Mr. Hurd said that he could eat almost every other kind until he was sick of strawberries, and then turn back to the Wilson with relish.

Messrs. J. G. Ramsdell and D. W. Mapes both agreed with Mr. Hurd that such had been their experience with the Wilson.

Mr. Hurd also mentioned the Triumph de Gand as a berry having some excellent qualities.

Mr. Mapes wanted to know how the Wilson would compare with Green Prolific and others in standing hot weather.

Mr. Hurd thought it would stand hot weather very well.

Mr. Hurd said he intended to set out a lot of the Charles Downings and Colonel Cheeneys and try them. He was also going to give the Triumph de Gand a fair trial, and probably some Boyden's No. 30.

Mr. Ramsdell asked what had been the average value of the Triumph de Gand when compared with other berries. Mr. Hurd stated they did not bear so many, but they were very superior in size and flavor. He thought they would bring more in Chicago. Mr. Mapes spoke of the Nicanor, and said he had heard it was a very early berry. He was anxious to find a very early variety. Mr. Hurd thought the Nicanor was not much (if any) earlier than the Wilson, and was of no better flavor.

Mr. Mapes asked if the Metcalf was not an earlier berry.

Mr. Hurd thought it was hardly enough earlier to make any practical difference.

Mr. Ramsdell said he had set out quite a variety on his orchard to test them, but a man whom he hired to plow plowed them all up. He had among them the Nicanor, the Charles Downing, Green Prolific, Mammoth, and several others. He had planted at his house the Wilson, Jucunda, and Michigan Seedling, and all of them did well. The Wilson, however, beat all the rest. The Michigan Seedling did well until last season. The Jucunda, on clay soil, kept from running into matted rows, did most as well as the Wilson. He thought it was peculiarly adapted to clay soil. If the runners were kept off, and properly cared for, he was satisfied it was nearly as good as the Wilson. If he were going to select four of the varieties that had proved best for market purposes, in his experience, he would choose the Wilson, Jucunda, Green Prolific, and Colonel Cheeny.

Mr. Hurd asked if the Jucunda did not ripen later than the Wilson.

Mr. Ramsdell replied that the Jucunda, Green Prolific and Colonel Cheeney all come after the Wilson.

Mr. Mapes stated that the Jucunda and Wilson held on longer than the Agriculturist with him.

Mr. Hurd said that the Charles Downing had come up wonderfully in the last few seasons.

Mr. Ramsdell said it had the advantage of being adapted to a large variety of soils.

Edwin Russell said that the Wilson was the most profitable with him as a berry for general purposes. He had never tried many kinds. His experience with Peak's Emperor had been that it was not as productive nor as sure as the Wilson. The berries were of a large size and fine flavor, but it was not sure. The first year he planted it, it bore more than it did the second year. He would be able to judge better of it after the next season.

A vote being taken, the meeting decided in favor of the Wilson, the Green Prolific, the Jucunda, and the Colonel Cheeney varieties, as the best for market purposes.

SETTING AND CULTIVATION OF GRAPES.

The Horticultural Society met at Dr. Ellis' office for the purpose of discussing the currant borer and his characteristics, but the members not being fully prepared on this subject, the subject of the setting and general cultivation of grapes was taken up.

Mr. Hurd said he had had some experience in setting grapes on sand. He aimed to have two eyes above the ground. He watered them with slops from the house. He dug a hole twenty inches deep and filled it up within four inches of the top, and placed the stake in the hole on one side before filling up. He mulched with good manure. Some grew from four to eight feet last year. He mulched again in the fall with well-rotted manure. He thinks they made all the growth he wanted. He has set this year eighty-one vines one year old, from the cutting of his own raising, and they are all well rooted. The varieties set were mostly Concords, and the balance were Delawares, Hartfords, and Eumelans.

Mr. Mapes made inquiry as to how far apart the vines were set.

Mr. Hurd set his eight feet apart each way, but if he had more to set he would put them 12 or 15 feet apart each way.

Mr. Ramsdell referred to the culture of grapes in New York State, and said that the best growers had planted further apart each year until there were many who planted as much as 20 feet apart each way, and Mr. A. C. Comstock, a very noted grape culturist of that State, said he would plant 15 feet by 30. Nearly all the growers in the Naples valley planted at least 12 feet apart each way, and it was not until these men had had such remarkable success, and taken so many prizes at the horticultural fairs, that their neighbors began to see that they were correct in planting far apart. The speaker called attention to the fact that he had seen one vine in New York State that was spread all over a house, which yielded 44 bushels in one season. He did not see what people wanted to keep the vine on a stake for. He believed the mildew was more often seen on closely-trimmed vines. He would plant his vines 12 feet apart and 20 feet in the row, and if he had plenty of land he would plant 24 feet in the row. He knows that close pruning has its advocates, such as Judge Ramsdell, but after a few years' trial he thought they would find it not best in the long run.

Mr. Hurd spoke of grape culture on Kelly's Island, and said they planted about eight feet apart each way.

Mr. Ramsdell said it might not do so much damage there to plant close together, for the vines did not make as vigorous a growth in that soil as they do here. On our soil they grow much faster, and require more space in which to run.

The direction of planting them came up, and Mr. Hurd stated that he planted east and west.

Ramsdell said he had done the same.

Mapes had planted north and south, more for convenience than anything else, and asked why the other gentlemen would plant east and west.

Ramsdell said the prevailing winds being in the west, they dried off the vines quicker after a rain, which was very necessary. Planted in that way, the winds could pass through the rows more easily.

Mapes asked if it had been a common practice to cut the vines back to two buds. He had always followed that, and his vines did not do well. Mr. McNabb had told him not to do it as they bled so as to injure them.

Ramsdell and Hurd asked him if he cut them in the spring.

He said he did.

Ramsdell and Hurd then very emphatically informed him that was the trouble with his vines. He should not cut them in the spring at all.

Barnes said he got a man to trim his vines and he cut them terribly, so that they bled enough to dampen the ground all around them. They made a very rapid growth, but he had less than half a crop of grapes that season.

Hurd asked about cultivating where they run on the ground.

Ramsdell recommended the use of a potato hoe or fork, but thought that thorough mulching was better and cheaper than cultivating on sandy soil.

The society then took a vote on the best distances apart to plant grape vines in this section, and recommended that Concordes be planted 15 feet apart with 20 feet in the row, and Delawares 10 feet apart with 15 feet in the row—these two kinds representing the extremes.

After selecting the "Currant Borer" as a topic next week, the society adjourned.

GOOSEBERRIES—THEIR CULTURE AND PROFIT.

"Gooseberries" being the topic for discussion, the meeting invited Mr. Ramsdell to open the subject.

He explained that the gooseberry was propagated from cuttings, in the same manner as currants. The cuttings were put in a cellar in the fall, and kept there until spring, when they were ready to set out. In his experience he found that mulching did a great deal of good, and prevented mildew, and made the bushes bear more plentifully. Since he came here he had experimented with the English varieties, which have always mildewed, and he discovered that they did not mildew here, even without mulching, thus showing that this climate is almost perfectly adapted to the English varieties. His experience here with them had been in heavy clay soil well drained, and he had found that it was well adapted for them. He thought thorough cultivation would pay well. He had never seen the time when there could not be sold twenty-five times as many as there were in the market. He was satisfied from what he had seen here that 500 bushels could be raised on an acre. The English varieties, the Houghton and the Houghton

Seedling he had always found perfectly hardy in this climate. They were free from all diseases, and are never troubled by insects except the currant worm and a little green louse, the latter, however, coming on after the crop, and doing no damage. And, by the way, he explained that the louse never troubled the English varieties. The former insect he said was easily killed and was not regarded as a very formidable enemy. After the gooseberries are four or five years old, they should have much of the old wood cut out.

In regard to the market Mr. Ramsdell said it never had been supplied. He sold his last year at four dollars per bushel, and knew parties who would have gladly paid five dollars per bushel if they could have got them.

Mr. Mapes said his experience had been on sandy soil. He had found the Houghton Seedling the most prolific bearer. He could endorse everything Ramsdell said in regard to propagation. He would cut in the fall so as to give them time to callus over. He found that the gooseberry needed rich soil. He had never given his manure or mulch, and hence what he did, was under unfavorable circumstances. He thought Ramsdell's estimate of 500 bushels to the acre was within bounds; 2,742 bushes could be put on an acre; and he had picked six quarts to the bush under really no cultivation. This would make over 500 bushels without any cultivation, and bring, at ten cents per quart, \$1,639.20.

Mr. Booth referred to a man near St. Louis, who picked eight quarts to the bush, and sold them at a shilling per quart.

Mr. Mapes said the gooseberry was almost as good to handle as the potato, and he didn't have to pick all of them at one time. He had studied the subject, and concluded that it was a perfectly safe thing to cultivate, and very profitable.

INSECT ENEMIES OF SMALL FRUITS.—A UNION FAIR.

The subject for the meeting to discuss was changed from the "Currant Borer" to the "Insect Enemies of the Currant and Gooseberry."

Mr. Mapes opened the discussion by stating that he knew nothing of the perfect insect from which the currant borer came. The only information he had been able to gather was from the Fruit Recorder of 1872, the editor of which explained that the moth that deposited the larvæ that made the currant borer was similar to the moth that deposited the larvæ of the peach borer. It was generally deposited at the base of the bud. He said the shoot which contained the borer should be cut off and the enemy be destroyed by burning. Further information, he said, could be had of Luther Tucker & Son, Albany, New York.

Mr. Ramsdell said he had generally noticed that their marks were on this year's or the previous year's growth. He had not yet decided whether they went up or down. He had found them going both ways, and had followed them to the root, and found that hollow. He had never seen any signs of the larvæ until after the first of June. He saw but very little of them last season any way.

Mr. Mapes said he did not think he saw as many last year as usual.

Mr. Ramsdell suggested a remedy. He would make the ground rich, and give a strong, rapid growth, leaving the shoots to grow, and cut out the old wood. He would renew the bush as rapidly as possible.

On motion the Secretary was instructed to write to Prof. Cook, of the Agricultural College, and find out if he knew anything of the borer.

The currant worm was then taken up. Mr. Mapes said he found several remedies,—dry wood-ashes, ashes and soot mixed, white hellebore and carbonate

of lime had all been recommended. To use these, apply on bushes when wet. From one to three applications were recommended as sufficient. One of his own plans had been to shake the bushes and mash the worms with his foot. He had found that the most effectual remedy.

Mr. Booth said the currant worm had troubled his black currants very much, but had not troubled his gooseberries.

Messrs. Mapes and Ramsdell had had the reverse exactly, and the black currants had been comparatively free, while the gooseberries and the red currants were severely attacked. And yet, in both instances, the gooseberry bushes and black currant bushes stood in the same row running east and west. This anomaly in the habits of the worm caused some surprise, and will no doubt stir up more research on the part of those interested.

After a brief discussion it was decided to continue the discussion of the insect enemies of small fruits next week.

The question of holding a Union Fair for the counties of Benzie, Muskegon, Mason and Manistee next fall at Pentwater, came up. The Secretary stated that he had had a talk with the Pentwater News editor, and that he had recently received an article from him regarding the matter, and that it was proposed to hold a convention at Ludington on the 9th of June, to form a Union Fair organization. It had been suggested that three delegates go to that convention from each county, but he thought that too small a number.

On motion the Secretary was instructed to write to the Pentwater folks and suggest a larger number of delegates.

He was also authorized to publish a call for a meeting of the fruit men and farmers to be held at the Times editorial office on Saturday, the 5th day of June, for the purpose of electing delegates to the Union Fair meeting to be held at Ludington on the 9th of June, 1875.

The meeting then adjourned.

EARLY HISTORY OF THE STATE AGRICULTURAL SOCIETY.

A PAPER PREPARED BY PROF. J. C. HOLMES, OF DETROIT, AND READ
BY HIM AT THE IONIA MEETING, WEDNESDAY, DEC. 2, 1874.

GENTLEMEN:—A very few days since I received a note from the secretary of this association requesting me to prepare a paper upon the early history of the Michigan State Agricultural Society. Had he made this request at a date sufficiently early to allow me time to comply therewith, I would have done so with pleasure. The very few days that have elapsed since I received the secretary's note have been so filled with a multiplicity of cares I have hardly had time to devote a thought to the matter, but I will try to give a few items.

1830, WHEN A TERRITORY.

In the Northwest Journal of May 12, 1830, published at Detroit, I find the following editorial, viz.:

"AGRICULTURAL SOCIETIES.—We have more than once urged the establishment of these useful associations in the Territory. We advert to the subject now simply for the purpose of asking if no measures of encouragement be within the competency of the Territorial Legislature."

In the same journal, under date of October 20, 1830, I find a notice of what was probably the first agricultural society organized in Michigan. This notice says:

"At an adjourned meeting of the farmers of the county of Oakland, held pursuant to an adjournment, at the house of Solomon Close, in the village of Pontiac, on Monday, the 6th of October, 1830, to take into consideration the expediency of forming an agricultural society, Amos Mead, Esq., was chairman, and C. A. Chipman, secretary."*

On motion of J. P. Sheldon, it was decided by the meeting that it is expedient to form a society for the promotion of agriculture.

*On the 11th of January, 1875, I wrote to Mr. C. A. Chipman, and received the following answer:
ROCHESTER, January 13, 1875.

J. C. Holmes, Esq.:

DEAR SIR:—Your favor of the 11th inst. was received this morning. There was formed in 1830 an Agricultural Society in Oakland county, of which I was secretary. A few of the farmers of the county met at Solomon Close's, and agreed to organize a society, to be called the Oakland Agricultural Society of Oakland county. Amos Mead was chairman and I was its secretary. Mr. Mead and myself were appointed a committee to draught a constitution, which was adopted at an adjourned meeting of the society. As the county was then quite new, very few farmers took any interest in the society. Amos Mead was chairman and I made secretary at the adjourned meeting. I think this was the last meeting of the society. There had been no premium list and no exhibition of the society. It fell still-born upon the county.

Very respectfully yours, etc.,

C. A. CHIPMAN.

The committee appointed at a former meeting to prepare a constitution, reported one which was read and adopted. The meeting then proceeded to the choice of officers, whereupon the Hon. Wm. Thompson was unanimously elected President; Amos Mead, Esq., and Stephen V. R. Trowbridge, Vice Presidents; Calvin Hotchkiss, John W. Hunter, Joseph Morrison, Oliver Williams, Abner Davis, Ezra Rood, and Erastus Ingersol, Directors; and Cyrus A. Chipman, Secretary and Treasurer.

The constitution of the Agricultural Society of the county of Oakland, adopted at this meeting, consists of fifteen articles, not one of which gives any intimation of the objects of the society. I do not find any record of a subsequent meeting. I think Mr. Chipman, the secretary and treasurer, is still residing in Oakland county, and if applied to could give a history of the proceedings of this, the first agricultural society organized in Michigan.

1833.

In the Detroit Courier of March 13th, 1833, I find this:

"At a meeting of citizens of the Territory of Michigan, convened at the house of Benjamin Woodworth, Esq., in the city of Detroit, pursuant to public notice, for the promotion of agriculture and domestic manufactures, His Excellency, George B. Porter, was called to the chair, and Major J. Kearsley appointed secretary. A petition to the Legislative Council was prepared, praying that an act of incorporation may be passed, which was signed by the persons present. On motion

Resolved, That Jonathan Kearsley, Thomas Rowland, John J. Deming, John M. Wilson and Henry P. Powers, be appointed a committee to adopt such measures as they may deem expedient to carry into effect the object of this meeting, and especially to use their exertions to procure an act of incorporation; and to report to an adjourned meeting to be holden at the same place on Thursday, the 21st instant, at 6 o'clock, P. M.

Resolved, That the proceedings of this meeting, signed by the chairman and secretary, be published in all the newspapers of the Territory.

Adjourned to meet again on Thursday evening, March 21, 1833.

(Signed)

GEORGE B. PORTER, Chairman.

J. KEARSLEY, Secretary.

An editorial in the Courier of April 10th, 1833, says:

AGRICULTURAL SOCIETY.—The bill incorporating an Agricultural Society of Michigan was taken up for a second reading yesterday. Mr. Sprague moved to strike out the section authorizing an appropriation to be made from the territorial treasury for the encouragement of said society, on the ground that we were not yet sufficiently advanced in wealth to warrant such an appropriation. There were more pressing objects to be provided for at present. He was not opposed to encouraging agricultural societies in the Territory, but it was too soon. The bill was laid on the table.

In the Courier of April 24th, 1833, is this item:

AGRICULTURAL SOCIETY OF MICHIGAN.—The bill granting a charter of incorporation to this society has passed the council.

On looking over the proceedings of the legislative council, I find that this bill passed on the 20th of April, 1833.

1849.

I have no knowledge of what proceedings were had under this act; but sixteen years afterward, in February, 1849, the first session of the Legislature after the removal of the capital from Detroit to Lansing, the Hon. Titus Dart of Dearborn was chairman of the committee on agriculture in the Senate. Being well acquainted with him, and being desirous that a State agricultural society should be organized in Michigan, I wrote to Mr. Dart that I thought it was time we had a State agricultural society, and he being chairman of the committee on agriculture in the Senate was the one to give it a start, and as there were at that time people at Lansing from all parts of the State, that was the

place to start it. After some correspondence upon the subject, Mr. Dart mentioned it to some of the members of the Legislature, who immediately responded in favor of the project. Thereupon a call was made on the 5th of March, 1849, for a meeting to be held at the capital on the evening of the 10th of March, to take into consideration the matter of forming a State agricultural society. This call was signed by the executive officers of the State and members of the Senate and House of Representatives.

THE FIRST MEETING UNDER THIS CALL.

HALL OF THE HOUSE OF REPRESENTATIVES, {
Lansing, Mich., March 10th, 1849. }

In pursuance of this call a meeting was held at 7 o'clock this evening, in the hall of the House, and was called to order by Hon. Titus Dart of Wayne county, on whose motion Governor Ransom was appointed president of the meeting.

The president, in taking the chair, expressed his gratification at this mark of distinction conferred by the meeting, and made an eloquent allusion to the pride which he felt in being able to call himself a practical farmer. He then invited gentlemen present to favor the assemblage with their views on the subject for which they had met.

On motion of Lieutenant-Governor Fenton, A. W. Hovey was appointed secretary of the meeting.

Mr. Dart offered the following resolutions, which were unanimously adopted, viz.:

Resolved, That a committee of seven be appointed by the president, whose duty it shall be to prepare and report, at a subsequent meeting, a plan for the organization of a State Agricultural Society, and that they are requested to report such a constitution and by-laws as they may deem most suitable to promote the legitimate purpose of such a society.

Resolved, That said committee be requested to inquire and report upon the expediency of applying to the Legislature for pecuniary aid in the organization and conduct of such a society; and also for applying for an act of incorporation for the same.

Resolved, That when this meeting adjourn, it will adjourn to meet at this place on Saturday next, at 7 o'clock, P. M., and that the public generally be respectfully but earnestly urged to attend.

The president appointed as the committee under the first resolution, Mr. Dart, of Wayne; Mr. Deming, of Lenawee; Mr. Salyer, of Washtenaw; Mr. Belding, of Oakland; Mr. Loomis, of St. Clair; Mr. McKinney, of Van Buren; and Mr. Matthews, of St. Joseph. The meeting then adjourned.

THE SECOND MEETING.

HOUSE OF REPRESENTATIVES, {
Saturday, 7 P. M., March 17th, 1849. }

In pursuance of adjournment, the meeting for the purpose of organizing a State Agricultural Society convened in the Capitol, and was called to order by Gov. Ransom, the President.

Mr. Dart, from the committee appointed at the former meeting, reported that the committee had performed the duty assigned them, and that Mr. Loomis would read the report.

Mr. Loomis read two bills drawn up by the committee for presentation to the Legislature, one of them incorporating the State Agricultural Society, and the other making an appropriation, under certain restrictions, in aid of the objects of the society; and also reported a constitution, which report was accepted and the committee discharged.

The constitution was taken up, read, considered, amended and adopted.

Mr. Levi Baxter offered the following resolution, which was adopted :

Resolved, That the State officers and members and officers of the Legislature be considered members of the State Agricultural Society, for the purpose of organization, together with such other persons as may comply with the requirements of the constitution. On motion of Mr. Loomis,

Resolved, That a committee of nine be appointed by the President as a committee of nomination of officers of the Michigan State Agricultural Society, and that such committee shall report at this place next Saturday evening, to which time and place this meeting will adjourn.

The president appointed as such committee Mr. Loomis, of St. Clair; Mr. McNeil, of Genesee; Mr. Campbell, of Livingston; Mr. Baxter, of Hillsdale; Mr. Adam, of Lenawee; Mr. Stevens, of Wayne; Mr. Ferguson, of Calhoun; Mr. Comstock, of Allegan; and Mr. Burk, of Berrien. On motion of Mr. Deming it was

Resolved, That Hon. Wm. M. Fenton be respectfully invited to deliver an address at the meeting of next Saturday evening, at which it is proposed to complete the organization of the Michigan State Agricultural Society.

On motion of Mr. Ferguson, Hon. John J. Adam was appointed treasurer *pro tem.* to receive money from those wishing to become members of the society.

The meeting adjourned till half-past six o'clock on Saturday evening.

THE THIRD MEETING AND ELECTION OF OFFICERS.

Lansing, March 23d, 1849.

At an adjourned meeting held in the hall of the House of Representatives, for completing the organization of the Michigan State Agricultural Society, his excellency, the governor, presided.

Mr. Chamberlain of Berrien county was elected secretary.

Hon. Charles A. Loomis, chairman of the committee appointed at a previous meeting to report the names of officers for the ensuing year, made the following report, which was accepted :

For President,—Epaphroditus Ransom of Kalamazoo.

For Recording Secretary,—J. C. Holmes of Wayne.

For Treasurer,—John J. Adam of Lenawee.

For Executive Committee,—Titus Dart, Wayne; Bela Hubbard, Wayne; Edward L. Fuller, Washtenaw; Townsend E. Gidley, Jackson; Stephen Valentine, Calhoun; William H. Edgar, Kalamazoo; Joseph Gibbons, Lenawee; John Thomas, Oakland; George Redfield, Cass; Jeremiah Smith, Genesee.

Also a vice-president and a corresponding secretary for each organized county.

On motion of Titus Dart, the society proceeded to the election of officers. Hon. Messrs. Dart and Walbridge were appointed tellers. The tellers announced that the society had, by a unanimous vote, confirmed the nominations made by the committee.

Governor Ransom, the president elect, tendered his thanks to the society for the honor conferred, and spoke of the advantages attendant on the formation of State agricultural societies.

An address was then delivered by Lieutenant-Governor W. M. Fenton.

On motion of Mr. Ferguson of Calhoun, it was

Resolved, That the society ask the Legislature to appropriate the sum of one thousand dollars for the use of the society, to aid in holding a State fair next fall.

The society then adjourned.

The Legislature passed an act to incorporate the Michigan State Agricultural Society. This act was approved April 2d, 1849.

The Legislature also passed an act in aid of the society, appropriating four hundred dollars, to be paid upon the receipt of an affidavit of the treasurer that the society had raised a like sum by subscriptions, or fees for membership. This act was approved March 31st, 1849.

This is the history of the organization of the Michigan State Agricultural Society.

THE FIRST MEETING OF THE EXECUTIVE COMMITTEE

was held in Detroit on the 22d of May, 1849, at 10 o'clock A. M., in a building that stood where the city hall now stands. After the transaction of some business, the committee adjourned to meet at 7½ o'clock P. M.

In the evening there were present the president, Messrs. Dart, Gibbons, Redfield, Thomas, Hubbard, and Holmes. A motion was made that a fair be held in September. Upon this question there was a long discussion. The trouble was that the society had not the means requisite for preparing suitable grounds for the exhibition, or to pay premiums. The appropriation by the Legislature was contingent upon raising a like sum by the society.

I told the executive committee that if they would decide to hold a fair, make out a premium list, and appropriate one thousand dollars for the payment of premiums, I would see that the money was raised. The committee then passed the following resolutions:

Resolved, That the society's first annual fair be held on Tuesday, Wednesday and Thursday, the 25th, 26th, and 27th of September, 1849.

Resolved, That the committee appropriate the sum of one thousand dollars, to be awarded at the fair to be held on the 25th, 26th, and 27th of September.

Resolved, That the society's fair for 1849 be held in the city of Detroit, provided the committee receive sufficient assurance that the local expenses of said fair will be paid by the citizens of Detroit. If not, then at such place on the line of the Michigan Central Railroad as will raise a sum sufficient to defray said expenses, not to exceed five hundred dollars.

The premium list was prepared and other arrangements made for a fair. The committee then adjourned.

THE FIRST FAIR, SEPTEMBER, 1849.

This was a bold move,—this asking for \$500 to fit up the show grounds, and without having funds in the treasury appropriating \$1,000 for premiums. It was the first effort of the society to make a show, and we did not know how it would be sustained. We went to work and raised from the people of Detroit the sum of \$523. We were then sure of the \$400 appropriated by the State. We thought this was a marvelous good beginning, and so it was, for our new society and our young State. The fair was held on a small piece of ground, measuring 370 feet on Woodward avenue and running back 800 feet. This answered our purpose, but it was well filled. It is now covered with stores and dwellings. There was on the ground a small hexagonal building called "Floral Temple." At the close of the fair the lumber was sold at auction, and this "Floral Temple" was bought by a gentleman in Detroit who moved it to his garden, where it has stood from that time to the present.

The exhibition of stock was not large, but it was pretty good. Every exhibitor thought he had the best on exhibition, if not the best that could be procured. Mr. Ira Phillips of Armada, Macomb county, exhibited the best Durham bull two years old and over, and was awarded the first premium of \$10.00. Mr. Phillips told me that when he bought this animal and paid what was then considered an exorbitant price, his neighbors laughed at him, and some of them thought he ought to have a guardian; but this fair operated as an eye-

opener to many of the farmers, and they immediately began to look around for improved stock : and I believe they have been improving ever since.

In every department the fair was a success. Financially it was a success. After paying all the bills, expenses and premiums, we had about \$1,260 in the treasury.

The constitution of the society, Article IX., said, " No officer of this society shall receive any compensation for his services." Of course we all worked for the love of working in so good a cause.

WHAT A STATE AGRICULTURAL SOCIETY SHOULD BE.

My own idea of what a State agricultural society should be, and the idea with which I started, has never been fully carried out. It was my wish in the beginning that the society should have a

CENTRAL OFFICE,

where should be established an Agricultural Library, Museum, and Reading Room, where could be found all the standard agricultural books, papers and magazines, models and specimens of agricultural machinery, implements, etc., specimens of agricultural and horticultural products, and general information upon subjects connected with agriculture and horticulture. This place, wherever located, should be the *headquarters* of the society and the office of the secretary. His salary should be sufficient for his support, so that he could give his whole time to the work of the society. The care of and the business connected with such a central office would occupy the time of one person certainly, and probably more.

Some of these last remarks will apply to the Michigan State Pomological Society. If this society had permanent headquarters, located at a point that would be the most accessible to fruit-growers of the State, where could be found a collection of specimens of insects that are injurious, and insects beneficial to vegetation, with a catalogue of their names, giving a full description of the insects, their history and habits, methods of ridding our premises of the destructive, and of protecting those that are beneficial; also a collection of birds, with their history and habits; models of fruits; a horticultural library, etc., the benefit to the people of this fruit-producing State would be incalculable.

I hope to see this Pomological association increase in numbers and in funds, that it may increase in usefulness.

THE CHERRY AND THE CHERRY TREE.

AN ESSAY READ AT THE SPRING LAKE MEETING OF THE STATE POMOLOGICAL SOCIETY, BY GEORGE PARMELEE, ESQ.,
OF OLD MISSION.

GENTLEMEN:—The present time for a discussion of the subject of cherry cultivation is probably well chosen. Seeing as we do the beauties and excellencies of this acceptable little fruit only retrospectively, our discussions may be presumed to take the channels of sober second thought, rather than to take on the appearance of extravaganza and sentimentality, which might happen were this discussion at a time of the year when this charming fruit could be present with all its attractions of beauty and excellence.

ITS SEASON,

following closely the strawberry, and extending to the heat of early summer, with its many practical culinary uses, its delicious and refreshing flavor, and perfect beauty, are so many reasons for its receiving, during its supremacy, our unqualified admiration.

SOUR AND SWEET CHERRIES.

The class of cherries known as *sour cherries*, being generally hardy, are raised more or less and are pretty well known to the mass of the people, while those that we term *sweet cherries*, being more tender in the tree and subject to more accidents, are much less cultivated. And it may be safe to say that not more than one person in four in the whole country ever regaled himself with a generous feast of the fine sorts. Good housewives understand the various uses of the sour cherries, but perhaps some have yet to learn that the dark English Morello, when dried, gives to fruit-cake a finer flavor than perhaps any other foreign or domestic fruit.

THE VARIETIES

of sour cherries most in cultivation are so easily raised that little need be said to a novice who may contemplate planting them. They put up with fence corners and neglect generally with as good grace as any other fruit tree, and will usually fruit in what would be called, for tender fruits, unfavorable localities.

THE USES

of the two classes of cherries seem to be mainly distinct, though they shade into each other: the sour for culinary, the sweet for dessert uses. Probably no person familiar with the better sorts of sweet cherries would be willing to accord them a second on the list of dessert fruits. We may say they are the perfect thing in their season, because we know of nothing in its season that we can place before them. Placing this high estimate upon them, it is reasonable to infer that there are great drawbacks to their cultivation or people would not be such strangers to them. I am not of those who believe that sweet cherries can be raised at only a few points scattered over wide areas of country; though the editor of the St. Joseph Herald made the astonishing discovery that they could be raised only at Alton and St. Joseph. Perhaps he could convince us that what we raise on Yellow Spanish cherry trees in latitude 45° are *nectarines*! 'Twould seem a logical conclusion, for they are full of nectar! There are drawbacks to this cultivation, but they are not of such an insurmountable nature as need keep the fruit from the tables of those who believe it a part of righteousness to live on the good things of earth. I will mention some of the drawbacks, and point briefly to some of the ways of surmounting them. The tree is very tenacious of its climatic conditions; extreme cold is fatal to the tree, and extreme heat to the fruit; it will not bear much pruning or careless handling; like plums it is subject to attacks from *cureulio*, and also to *destruction by birds*.

While some parts of the State have climatic conditions more favorable to the production of this fruit than others, there is probably hardly a county in the settled portion of the State that cannot furnish sites where the conditions of climate will admit of their successful cultivation. The difference in temperature between hills readily sloping in several directions, and that of hollows pent up on the sides of their natural outlets by bodies of timber, is very great, and in the trying times of severe winter is enough to make the difference between freedom from injury and destruction by cold. These differences I have proved by a great number of thermometrical experiments, finding in one instance a difference of 27°. This is an extreme difference, but in other cases, measuring by results, I have seen the lower part of a peach orchard destitute of atmospheric drainage, killed clean to the ground, while the higher parts had not even the fruit buds injured.

ALTITUDE,

without the proper configuration, does not afford security; for elevated hollows may be very frosty, while, on the other hand, a swell of land less elevated than such hollows, but with free slope to a lower plain, will be comparatively free from frost. Hollows are worst of all places for tender fruits, and next to them are level plains. Those portions of the State not enjoying the influence of a near body of water can make up the deficiency by planting on such hills as we have indicated.

THE ROT.

We said great heat was a drawback, but it is probable that it is so from the fact that, in connection with moisture and other conditions of growth, it results in a too rapid process of ripening, causing the whole crop to rot at such times. By planting in elevated and airy situations where no accumulation of heat can take place, and where the soil is not rich, and without manuring, the attacks of rot will seldom occur.

HANDLING.

No tree is so sensitive to bruising or breaking as the cherry, and it requires very little pruning. So that with common caution in handling at the transplanting, in the after care, and with the true science of pruning, which, with all fruit trees is to cut as little as possible, *and rarely to shorten in*, this sensitiveness of the tree ceases to be a great difficulty.

THE CURCULIO.

Many people have sweet cherry trees which annually set good crops of fruit and as often disappoint the wishful owners by the attacks of the curculio. Such persons are too negligent or have too much to do to apply the necessary remedies; for we can hardly conceive of any citizen of Michigan, who takes enough interest in fruit to grow a cherry tree, who can be ignorant of the known methods of destroying that insect.

THE DESTRUCTION

of this crop by birds can and should be remedied. The Cedar bird or Cherry bird is the principal destroyer of this crop. Other birds work at them slowly, usually devouring all of the cherry they attack, while the cherry bird takes only a bite or two from a cherry, mutilating and thus destroying probably a quart to make his little self a meal. And when such cherries are worth twenty-five cents a quart we can estimate the cost of boarding those little cormorants.

With the loss of the trees by the winter of 1872 and 1873, with the rot the present season, with the attack of the curculio and the destruction by birds, it is a fact that nearly the whole west, in town and country, has been without sweet cherries the past season. In some cases where a single tree has stood near a dwelling, the birds have been kept from the fruit by hanging a bell in the tree with a string running from it into the house, where some person could frequently give it a jerk and thus frighten the birds away. Such an expedient, at best, can only save to the family a supply for themselves. If we cannot relieve our cherry orchards of the depredations of this little pirate, we may as well cut them down, and the lovers of cherries in town may give up this pleasant source of enjoyment and health.

The legislators of this State have declared it a crime punishable by a fine of \$5 to kill a cherry bird. We are ready to give them credit for good intentions in the passage of the law; but they acted on partial information. It has been claimed that these birds are insectivorous, more than compensating for their little peccadilloes by destroying noxious insects. At different times during the past season I have examined the stomachs of eleven of these birds, usually with a magnifying glass, and have, every time, failed to find any insect food. And I have found, by four different examinations of young birds in the nest, that they, too, have no insect diet.

In all my experience I have found no exception to these statements. The cherry bird is an *unmitigated pest, and should be destroyed*; else we must give up one of the most beautiful and luscious of all the nice fruits.

The plea for the cherry bird is simply sentimentalism. He may be pretty, but he is not good. A cherry is both.

This indiscriminate adulation of the feathered warblers is bringing its fruits. The English sparrows which these bird-lunatics have brought over from Europe, are proving to be the scourge that people who knew their habits declared they would be. They are increasing rapidly, and wherever they spread

are destroying the really useful birds. As well go into ecstasies over the blossoms of the Canada thistle because it is beautiful, and import it to your farms, as to bring the sparrow and the cherry bird to your orchards.

HARVESTING AND MARKETING.

A word about harvesting and marketing sweet cherries may interest some. They should never be pulled from the tree, for two reasons: pulling frequently breaks off the spur containing the blossom buds for the next season, and it frequently loosens the stem from the cherry, thus starting the juice, which very soon causes the rotting of the cherry. An extra expense of one cent per quart over the ordinary way of picking, will pay for cutting the stems near the middle with a pair of scissors. When thus picked, and carefully packed in quart boxes, they can be kept a long time or sent long distances. I am unable to say how long they may be kept, but will say that we kept a box of Yellow Spanish cherries, the past summer, ten days in an ordinary room, without any indications of decay.

When I speak of quart boxes I mean a dry-measure quart, not the diminutive thing that dishonest and short-sighted men are every year scrimping and calling "a quart box." People who buy fruit do not decide the question whether they buy or not on the cost of a single package, but on the question "what does it cost to supply my family?"

A pint box itself costs about as much as a quart, and pays nearly as much freight, requiring a large part of the consumers' money to pay for packages, thus making the fruit supply for his family more costly, and often ruling it out to the injury of the market for the grower.

Cherries shipped in quart boxes are not sufficiently massed to crush the pulp or start the juice in ordinary handling, and can be sent long distances, and will not injure the market by risk of rotting on dealers' hands.

In selecting varieties to plant, the safest rule is to plant those varieties that are proved most successful in our own vicinity, remembering that, in all fruits, valuable additions to the list of well tried or standard varieties are not of frequent occurrence. While a given list may be of some value where there is no local experience to guide, it is best for a person planting to post himself as to the success of the nearest cultivated varieties, and to use great caution against planting varieties not generally known.

THE BLACKBERRIES AND RASPBERRIES RECOMMENDED BY THE SOCIETY.

BY T. T. LYON, SOUTH HAVEN, MICH., AND PREPARED FOR THE SUMMER MEETING HELD AT MONROE, 1875.

MR. PRESIDENT AND GENTLEMEN: Having been requested by your Secretary to prepare some account of the blackberries and raspberries recommended by the society for cultivation in Michigan, I may be indulged in a few remarks preliminary to the subject, before entering upon the discussion of the varieties to be considered.

It is only within the last twenty years that the attention of fruit growers has, to any considerable extent, been directed to the cultivation of either the blackberry or the black-cap raspberry, with reference to the production of improved varieties; and even up to the present time, so far as we are informed, such efforts have been directed only to the selection and propagation of such chance sorts as have sprung up in a wild state.

Prior to the above named period, persons had, occasionally, indulged in the gathering of wild plants into cultivated ground, with the hope that cultivation would exert an ameliorating or improving influence upon the quality of the fruit. This process, however, seems to have yielded no very encouraging results.

It is little more than fifteen years since the date of the earliest efforts for the production of new and improved varieties of the American Black Cap; although, as in the case of the blackberry, it had previously been the practice of persons partial to this fruit, to collect plants from the field and hedge rows and subject them to the ordeal of cultivation; more perhaps, for the purpose of having the fruit at hand when wanted, than with any especial reference to the improvement of its quality.

THE BLACKBERRY

is common to both the eastern and western continents; but the variety or rather species common in many parts of Europe and Asia, and known as *Rubus Fruticosus*, seems to be a somewhat near approach to the raspberry, in the form of its fruit, if not also in the characteristics of the wood growth. We have also, in this country, two nearly allied species known as the Dewberry (*Rubus Hispidus*), which seem to be quite generally disseminated in a wild

state, and more or less so, if we mistake not, in Europe also, as *Rubus Cæsus* and *Rubus Canadensis*. So far as we are informed, however, all our cultivated varieties, of recognized value, are supposed to have sprung from the common high-bush blackberry, *Rubus Villosus*.

One of the first attempts, within our knowledge, to introduce the blackberry to cultivation, was that of the late Capt. Josiah Lovett, of Beverly, Mass., who was the introducer of the Dorchester; a variety which, although not recommended by this society, has been for many years, and still is, esteemed in the markets of Boston.

The next variety to appear prominently before the public, and the first one to which your attention is invited as having been recommended by this society for cultivation in Michigan, is the

NEW ROCHELLE, OR LAWTON,

which was discovered, as a wild plant by the roadside, in the town of New Rochelle, Westchester county, N. Y., by Lewis A. Seacor, about the year 1845 to 1847. The fruit was so distinct, and so superior to others, that he transferred it to his garden. In 1848 it attracted the notice of a Mr. Lawton, also of New Rochelle, who procured plants and commenced its propagation. It seems to have received, at his hands, its first prominent introduction to the public by the presentation of a branch, laden with fruit, at a meeting of the American Institute Farmer's Club, held in the city of New York in 1853. By means, apparently, of a little rather questionable practice on the part of Mr. Lawton, the club was induced to christen (or rather rechristen) the variety as the Lawton,—a name that has adhered to it; although Mr. Downing, in his work on fruits, gives New Rochelle as the leading name. Mr. Lawton seems to have made the most of this christening, by advertising and disseminating it extensively, at high prices, no doubt greatly to his personal advantage.

A correspondent of the Horticulturist, in June, 1855, writing from Adrian, Michigan, and who had been a visitor at New Rochelle about this time, gives a very full history of the origin of this fruit, which he concludes with the following remarks: "There have been many conjectures as to the origin of this fruit. It is known that a relative of a former proprietor of the farm (on which the original plants were discovered) brought shrubbery from England, and some suppose this blackberry was then introduced; others think the Huguenots, who originally settled New Rochelle, brought it with them from France; but the prevalent belief appears to be that it is an accidental seedling. For the facts embodied in this letter, I am indebted to a communication from Frederick Prince, Esq., (the present owner of the farm where the fruit was found) published in the Westchester News, and to the verbal statements of Mr. Seacor and some others of his neighbors, and I have every reason to believe all these statements to be substantially correct."

In the same volume of the Horticulturist, at page 353, will be found a communication from the late A. C. Hubbard, of Detroit, tending to confirm the supposition of the English origin of this. We extract as follows: "We had a large pot of these blackberries in the greenhouse this spring, which was observed by a Scotch gardener whom we had just employed. 'Ah!' he says, 'and here you have the Scotch Bramble.' 'No,' I said, 'it is a new variety of blackberry, a seedling, a very superior kind.' 'Ah, but it is the Bramble! I know it. I have seen them filled, just filled with fruit as big as that (measuring off two-thirds of his thumb). Ah! you would have to make two bites to

every berry.' He went on then describing how it branches out, and how it was completely filled with fruit so that the branches would bend over to the ground, and described the enormous quantity obtained from one branch, their delicious flavor, etc., etc."

These and other reports of the wonderful character of this new variety seem to have induced Mr. Charles Downing to inquire carefully into the facts in the case, and also to visit and examine the fruit upon several plantations. His conclusions are embodied in an article which appears in the *Horticulturist* for 1855, at page 451, from which we quote as follows, alluding to the article of Mr. Hubbard:

"A species of bramble it certainly is; but that he ever saw this identical blackberry is a matter of doubt. If it is an old fruit and so well known in Europe, how is it that it has not been introduced and propagated among the nurserymen and amateurs here, along with their other importations of new and good fruits? One thing is certain: it is a valuable fruit and deserves the attention of amateurs and fruit growers, and every person who cultivates even a small portion of ground would do well to procure a few plants. A dozen or so in full bearing will give fruit sufficient for an ordinary family for some six weeks.

The society only recommends this blackberry for market, with a caution as to hardness. Our impression is that it went upon the list in compliance with the preferences of St. Joseph planters and with reference to the wants of planters along the Lake Shore, where its success was assumed to be more certain than in the State at large, where, if not protected, it is frequently winter-killed at the top on account of its habit of making late growths and hence going into the winter with imperfectly ripened wood. Still there are not lacking cases in which, with winter protection, it has proved highly profitable even in the interior of the State.

One of its most serious drawbacks as a market fruit is its extreme delicacy of texture; which, to some extent at least, unfits it for lengthened transportation by rail. To Lake Shore growers who can pick it over night, and have it put down in Chicago or Milwaukee by steamer in the early morning, it will no doubt be found profitable when carried safely through the winter, the chief danger being that even a slight killing of the top is pretty certain to seriously diminish the next crop. Owing largely perhaps to this difficulty some of the more recent sorts seem to a great extent to be superseding it even there.

The fruit becomes fully colored some time before it acquires its full flavor. Hence experience is requisite to properly determine the time of picking, and it usually goes to market while yet partially unripe and sour. The most experienced growers advise to leave the berry upon the plant till it will drop into the hand upon the mere touch of the fingers. When picked in this manner and the plants kept low and well branched by clipping or pinching in summer, with protection in winter when requisite, we are persuaded that it will be found satisfactory, and under such treatment we have little hesitation in commending it to even amateur planters for home use throughout the State, except possibly at the extreme north.

KITTATINNY.

The first published notice of this blackberry that has come under our observation, occurs in the November number of the *Magazine of Horticulture* for 1864, at page 407, before it had been offered for sale by the introducer. It was

discovered by Mr. E. Williams of Montclair, New Jersey, at the foot of the Kittatinny mountain, in the town of Hope, Warren county, in that State, and was by him brought under cultivation, and also farther tested by sending plants for trial to several persons in distant localities, one of whom was the writer. It was first offered for sale, if we mistake not, in the year 1863, and soon became widely disseminated. A figure of the fruit appeared in the *Horticulturist* for that year, at page 271, with the following description by the editor: "We find it to possess such good qualities that we give a portrait of it. We selected for the purpose a medium-sized berry; the size, however, is very uniform. The outline of the fruit, it will be seen, is somewhat like that of the *Dorchester*, but not so regular. It might very well be described as a berry between the *Dorchester* and New *Rochelle*. The berry is longer than the latter, but more irregular than the former. The pips are as large as in the latter, with all the sweetness of the former. It has a delicious flavor. The pips seem to ripen very uniformly, and the seeds are very small. It is very productive, if we may judge from the bearing shoots we saw. One the whole, we regard it as a large, handsome, and high-flavored fruit."

When in season in 1865, a party visited the locality in New Jersey, where it originated and where it was yet principally grown, and the following account of it was given by Mr. Downing, who was one of the party. He says: "We visited several gardens where it was more or less grown—in one, I should think, to the extent of half an acre; but only one with good cultivation. As to vigor and productiveness, I did not perceive any difference,"—between this and the New *Rochelle*, we suppose,—"except that the leaves were a little more serrated, size of berry being fully equal but rather longer, decidedly sweeter, and an acquisition to this class of fruits. In one of the gardens the *Kittatinny* and *Lawton* were growing side by side and apparently of the same age, so that we had a fair opportunity to compare and examine them fully; and I consider the *Kittatinny* the best blackberry I have yet seen."

This berry is now extensively grown, and the above early impressions as to its value in comparison with the New *Rochelle* seem to have won well-nigh universal approval and confirmation. In fact, so far as hardiness is concerned, it is our impression that in most cases it will prove fully equal to our native wild plants, which are known to be frequently killed in winter when standing unsheltered in the open ground.

Within the last few years a more recent candidate for the favor of the market planter seems threatening to eclipse the *Kittatinny*, and usurp its place in the public estimation, even as a market fruit, and possibly the time has already arrived when it should be the duty of the society to add it to the list recommended for that purpose. We refer to the

WILSON'S EARLY,

a variety also originating in New Jersey, it having been first brought to the notice of planters by John Wilson of Burlington, in that State, some time prior to the year 1866; although, at that date, it had been little disseminated outside of that State. In April of that year the *Magazine of Horticulture* speaks of it as follows: "This is a new variety which has been extensively cultivated in New Jersey, and proved to possess considerable value. It has the habit of ripening its crop mainly together, and is principally over in two weeks and before the height of blackberries comes on. The price runs high, and it does not come in competition with any other blackberry, but it is ahead of

them all in the market, and brings more money. Its earliness is its principal value. With this variety the blackberry season is lengthened two or three weeks, making the period of supplying the market with this fruit nearly three months."

In the Horticulturist for September, 1867, in an article on "The Blackberry," by Andrew S. Fuller of New York, he characterizes it as follows: "I confess to an agreeable surprise with this variety, for it has really proved to be superior to the high encomiums which were bestowed upon it by those who first disseminated the plants. The berries are enormously large, far excelling the New Rochelle, being much longer, and nearly or quite equal to it in diameter. * * * The extreme earliness of this variety is greatly in its favor. Following closely the raspberries, it fills a space in the season heretofore almost unoccupied, and offers an opportunity to the grower of small fruits of keeping his baskets and crates continuously in use. The berries all ripen in about two weeks, and the entire crop may be disposed of before the later varieties begin. The Wilson's Early will doubtless become one of the most popular market varieties."

In taking leave of this, the last of the varieties recommended by the society, we only add the remark that it seems, at least in Western Michigan, to be assuming a leading position among planters, both for domestic and market purposes. True, it is by no means the equal of the Kittatinny in quality, though it excels both that and the New Rochelle in size. This advantage, however, for market purposes, seldom fails to carry the day as against quality alone; and this fact, together with its superior earliness, and the economy of gathering and marketing, on account of its habit of ripening together, affords a very weighty and conclusive reason for its growing popularity.

Although there are and have been for some time more recent candidates for the favor of planters of the blackberry, so far no one of these has been able to establish itself prominently in their confidence. In fact, one of the leading if not the leading consideration urged in favor of the most of these is their alleged superior hardiness; although some of them, as for instance Hoosac Thornless and one or two others, present the additional recommendation of the increased convenience of handling the plants and gathering the fruits.

Quite a number of them are recommended to the fanciful planter as amber, red and white blackberries; but so far as proved, all these seem to be lacking in such essential qualities as hardiness or productiveness.

BLACK CAPS.

As we have already found occasion to remark, the effort to produce improved varieties of the native Black Cap is of but recent origin; and, as has been found to be the case with the blackberry, such efforts have apparently been confined to the selection and subjection to culture and artificial management of such wild sorts as seemed most to manifest an improvement in quality. A few varieties, like Purple Cane, Ellisdale, and more recently, and perhaps in a more striking manner, Ganargua, give some indications of a possible origin, by hybridization between the Black Cap (*Rubus Occidentalis*), and the native red raspberry (*Rubus Strigosus*), or possibly the European species (*Rubus Idaeus*). If, however, such hybridization has actually taken place, it must clearly have been accidental. Indeed, we have no account of any efforts for the production of improved varieties of the Black Cap by any system of artificial reproduction from the seed.

The first, or at least one of the first selections of improved sorts from the wild stock, was that of the

DOOLITTLE,

which the society has included in each of the three lists. This, according to Downing, was introduced to the public by Leander Joslyn of Phelps, Ontario county, New York. It soon began to attract attention as a market fruit, and was commended by Barry, Bateham, and others, at the meeting of the American Pomological Society held at New York in September, 1858. At the next meeting of that society, held in Philadelphia, in September, 1860, it was again highly commended by a large number of pomologists, and after some discussion it was christened the Doolittle raspberry.

This Black Cap was, for several years, almost the only one in the field, and for that reason, doubtless, was the more extensively disseminated. Indeed, for a time, it seriously threatened to nearly if not quite drive the more luscious but less hardy red varieties from our plantations of market raspberries. It was extensively propagated and disseminated by Mr. Doolittle, of the State of New York, from whom its name seems to have been derived. For some years past, however, other candidates of this class have been introduced to challenge the popular favor; and some of them at least appear to be outstripping it in the race for popularity.

THE MIAMI

only appears in the amateur list. It is said to have been originally found growing wild in the Miami Valley, Ohio, whence its name. Mr. Downing characterizes it as of less value than the McCormick (better known here as Mammoth Chester), which is doubtless true, if estimated strictly with reference to its marketing qualities; but, for domestic use at home, it has, in our estimation, some decided advantages over any other Black Cap with which we are acquainted. It is clear, purplish black in color, with more juice and less seediness than any other of its class. It is not as high flavored as some others, but when prepared with sugar, it is perhaps the nearest approach to the reds of anything to be found among the Black Caps. It is a good bearer, and the fruit of fully medium size.

DAVISON'S THORNLESS

appears only in the family and amateur lists. It is claimed to have originated in the garden of Mrs. Davison of Erie county, New York. It can hardly be called a vigorous grower, as compared with others of its class, and the plants are nearly or quite without any spines, except upon the footstalks of the leaves. They are, for that reason, very much more convenient to handle both for cultivation and for the gathering of the fruit. The plant is of average productiveness,—the fruit rather small,—sweeter and earlier than any other of its class. Coming as it does in advance of others, it fills a place otherwise vacant. This circumstance constitutes its principal value.

MC CORMICK, OR MAMMOTH CLUSTER,

appears in each of the society's lists. It is the largest, most vigorous and productive of the Black Caps, and has already encountered the usual experience of widely popular fruits,—that of acquiring various synonyms in different parts of the country. Indeed, this fruit seems more than usually unfortunate in this respect, for one so recently introduced, as Downing, in his work on fruits, gives no less than six synonyms. We follow him in giving the McCormick as

original or leading name, although the variety seems to be universally known, in Michigan, as Mammoth Cluster. Mr. Downing says of it: "It has stronger and more vigorous canes, having fewer spines and more productive, and is the largest and best Black Cap we have yet seen. Fruit similar in form to American Black Cap, but of much larger size, of deeper color, more bloom, juice, and sweetness." It is also slightly later than other Black Caps,—a circumstance no doubt favorable to its popularity.

This is still what may properly be called a new variety, and we know of no new fruit, of any class, that has come to be so generally introduced, within so limited a period, and that, too, with such general satisfaction to planters. Still this is a comparatively new and untried field; and with the probable constant accession of newer competitors for the popular favor, it is more than possible that even this variety shall soon be thrust aside to make way for a newer and more desirable, or at least more pretentious claimant.

THE ANTWERP, OR RED RASPBERRY (*Rubus Idæus*),

is reputed to be the parent of all our cultivated varieties of this class. This is probably the fact, and indeed, may be assumed to be so beyond all question, so far as the great mass of the older varieties is concerned; but the distinction between this and our native red raspberry (*Rubus Strigosus*) is so narrow and, to our mind, based upon peculiarities so liable by variation to run into each other, that we are hardly able to assure ourselves that at least some of the later varieties of American origin may not have sprung from the latter. In order that our difficulty, in this respect, may be the more readily and perfectly comprehended, we quote from Darlington's "American Weeds and Useful Plants:"

"*Rubus Idæus*, Linnæus.—Stem suffruticose, erect, terete, not glaucous, hispid at base and somewhat prickly above; leaves pinnately 3-5-foliate; leaflets rhomboid-ovate; flowers in paniculate corymbs; petals entire; carpels slightly rugose, finely pubescent, not pitted in drying.

"*Ida Rubus*, *Antwerp Raspberry*, *Garden Raspberry*.—Root creeping; stem 3-5 feet high, branching, mostly hispid when young, especially towards the base, smoothish (or sometimes pubescent) and armed with slender recurved prickles above, the hispid bark, below, exfoliating the second year. Lower leaves odd pinnate by fives, the upper ones by threes; common petioles 1-3 or 4 inches long; leaflets 2-4 inches long, acuminate, unequally incised-serrate, smoothish and green above, clothed with a dense white, cottony tomentum beneath. Petals white. Carpels incurved at apex, clothed with a very fine, short, dense pubescence, whitish, amber-colored or purple, when mature.

"Gardens: cultivated. Native of Europe. Fl. May; fr. July.

"Obs.—This species is much cultivated for its favorite fruit. The plant presents some varieties—particularly in the size and complexion of the fruit; and I am not sure that the following nearly allied native species, which is found on our mountains, is not sometimes seen and mistaken for it in the gardens. * * * * *

"*Rubus Strigosus*, Michaux.—Stems slightly glaucous, but with stiff, straight bristles (some of them becoming beak-hooked prickles); leaflets becoming oblong ovate; fruit light red.

"*Strigose Rubus*—Wild Red Raspberry.—Stem, 3-5 feet high, light brown. Lower leaves odd-pinnate by fives, the upper ones ternate; leaflets about three inches long, hoary beneath, the terminal one often cordate at base. Corymbs 4-6 flowered, axillary and terminal, often aggregated and forming a leafy panicle at the top.

"Hillsides, especially in cleared land. Fl. May; fr. July.

"Obs.—This species is common northward, especially in mountainous regions. It often appears in great profusion where timbered lands have been burned over. We have seen it on the clearings in Maine, in the fruiting season, in such abundance as to give an uniform red color to large tracts, and having a delicious flavor not equalled by the cultivated species—if that be really distinct."

Gray, in describing *Rubus Strigosus*, also says: "Fruit ripening from June to August, finely flavored, but more tender and watery than the Garden or European Raspberry (*Rubus Idæus*), which it too closely resembles."

Under all the circumstances we may be permitted to entertain the supposition that the separation of the two may possibly be attributed to the very profound respect entertained by our later French-American botanist—Michaux—for the conclusions of the great father of botanical science, Linnaeus, who may be supposed to have known little or nothing of this western species.

ORANGE,

more commonly designated as "Brinckle's Orange," originated with the late Dr. W. D. Brinckle of Philadelphia, long an earnest and successful experimenter in the field of pomology, and widely and favorably known as the first president of the American Pomological Society. Although confined to the narrow and unfavorable limits of a small, paved city yard, he was, for a considerable period, a decidedly successful originator of seedling strawberries and raspberries, though confined chiefly to pots or boxes of earth in which to grow his plants. The Orange raspberry was thus grown from the seed of a red European variety, known as Dyack's Seedling, and first fruited in 1845, when two years from the seed. Along with several others, originating at the same time, and under the same apparently forbidding circumstances, it was introduced to the notice of the public by being placed on exhibition at a meeting of the Pennsylvania Horticultural Society, in the year 1850. It soon came into the hands of numerous cultivators, and rapidly won a very high reputation for beauty, high quality, vigor, and productiveness. In September, 1854, at its session in Boston, the American Pomological Society placed it on its list of varieties that promise well. At a meeting of the Western New York Fruit Growers' Society, held at Rochester in 1863, five lists of the best six raspberries to be recommended for general cultivation were furnished: one each by Barry, Downing, Lay, Hooker, and Frost, all of which included this raspberry. Indeed, it has proved itself to be one of those very rare fruits that, in all localities and under all circumstances, maintains its high character unabated, although it is, without doubt, most successful on somewhat strong soils. As will be found true of all fruits, however, it will richly repay superior culture. Still, it must be admitted that, with all these desirable qualities, it has serious and, for some purposes, almost fatal defects. The plant is too tender to stand even the winters of Eastern Pennsylvania and New Jersey unprotected, and nothing short of laying down and covering will carry it safely through even the more moderate of our western winters, if we except our favored "Fruit Belt," in which it seems to have proved sufficiently hardy; and, possibly, in some other exceptionally favored localities, or where it will, with certainty (as in Northern Michigan), be buried out of harm's way during the entire winter, by the accumulation of the snow.

The fruit also proves too tender for lengthened land transportation to market, though we see no reason why it may not be found a desirable and profitable sort for markets accessible by water, when once it comes to be known and appreciated. Still, with color, excessive delicacy of texture, lack of hardiness and only moderate productiveness against it, the society have doubtless acted wisely in limiting it, as they have done, to the amateur list.

PHILADELPHIA

appears in the lists of the society, with the recommendation to plant it for market, family and amateur purposes.

One of the earliest notices we find of this variety we extract from the Magazine of Horticulture for 1863, at page 460, as follows: "A native variety,

found growing in a wood, within the limits of the city of Philadelphia. It is perfectly hardy, requiring no protection during the winter, nor any extra care or culture; will grow in any good corn soil, produces immense crops and sells at high prices. The fruit is large, of a purplish red, darker than the Antwerp, rich and fine, bearing carriage well. Canes purple, very strong, with but few spines, thick and stout, standing upright without stakes or railing."

A very similar notice of this variety also appears in the Gardener's Monthly of the same season.

In 1864, a writer in this latter paper says: "If confined to two kinds they would be the Doolittle Black and the Old Philadelphia, which has been about twenty-six years working itself into public notice, and will become the principal variety grown in this vicinity unless some other of superior merit is yet discovered."

The above statement would fix the origin, or rather discovery of this variety, at or about the year 1838; thus making it one of the oldest varieties found in the society's list of raspberries.

The Gardener's Monthly, in giving a figure of this raspberry, in August, 1865, characterizes it in our estimation very justly as follows: "It is extremely difficult,—perhaps impossible,—to get every good point we wish in any one variety.

"This is, perhaps, in its combination of properties, as near perfection as anything we have. If it had a little larger size and was quite equal to some of the English breed in flavor, there would be nothing more to be desired in the raspberry."

This last remark in the Monthly, as also the description in Downing, would perhaps warrant the inference that they consider this variety to be descended from our native Red Raspberry (*Rubus Strigosus*), although we had supposed, and we are yet of the opinion that they suppose it to have been a chance European seedling originated in American soil. The hardiness and productiveness of this variety have given it a very decided popularity as a market fruit throughout the State, and even at the lake shore the exemption from winter-killing is a decided element of such popularity. Still, so far as our observation extends, it seems to divide the preferences of planters pretty equally with the

CLARKE,

which appears on the market and amateur lists of the society recommended for the lake shore region, and which began to attract public attention almost simultaneously with the Philadelphia. It is understood to have originated with E. E. Clarke, of New Haven, Connecticut. In August, 1862, the editor of the Horticulturist, Peter B. Mead, or perhaps the assistant editor, George E. Woodward, speaks of it as follows: "Last spring we received a seedling raspberry from Mr. Clarke, of New Haven. It has fruited and afforded us much satisfaction. It is a stout grower and has borne abundantly. The berry is large, sweet, and high-flavored: it is decidedly a good thing." In 1866 the American Pomological Society was to have assembled at St. Louis, Missouri, in September, but deferred its meeting for one year, on account of the prevalence in that city, at the time, of contagious disease. At this deferred meeting the originator exhibited branches of this raspberry with the ripe fruit upon them. The society endorsed the variety as valuable, among the Antwerp class. In the August number of the Horticulturist the editor speaks very fully of this variety, giving some items of its history with his matured conclu-

sions as to its value, which so fully corresponds with its general reputation, that we quote him entire as follows: "This variety we have now known some four years. It is a fine grower and a good fruit, the canes perfectly hardy. Mr. Elliot, of Cleveland, writes us that the plants he has of it so much resemble, in general appearance of the canes and fruits, those of the Kirtland, that he would like to gather the history of the Clarke; perhaps Mr. Clarke, of New Haven, will write it out for us. The Kirtland is supposed to be an old variety not yet identified. It did not originate with Dr. Kirtland, but his name was attached to it by H. B. Summ, Esq., simply because the plants he obtained came from the doctor's grounds and were unknown by Mr. Summ. The variety was on the doctor's place, so he tells us, when he purchased the property, and the old original bed is there yet. It is certainly one of the very best hardy old sorts, of good flavor and productiveness, but not quite firm enough for market transportation for long distances."

The Clarke unquestionably possesses an unusual assemblage of valuable qualities; its essential drawbacks being that it is not quite "iron clad," and that it lacks the firmness necessary for transporting long distances by land conveyance. As compared with the Philadelphia, however, it is clearly superior in size, color and quality. Whether originating from the European (*Idæus*) or the American (*Strigosus*), judging from the phraseology employed by writers in speaking of it, there seems to be the same uncertainty that has arisen in the case of the Philadelphia.

PURPLE CANE,

although we place it last among the varieties to be considered, is by no means a recent sort, or even one of recent introduction. We probably cannot better give what is known of the origin, history and value of this old and partially forgotten variety, than by quoting from the discussions of the American Pomological Society, at its session held at Philadelphia in September, 1860, which we do as follows:

"Warder—I ask for information in regard to the Purple Cane.

"Downing—The Purple Cane and the American Red Cane I think are alike. I consider it the farmer's raspberry. Thirty or forty years ago it was extensively cultivated around New York.

"Scott—The Purple Cane is the *Rubus Occidentalis*.

"Satterthwait—It is the only raspberry I have found to stand the test. I never found any other to pay as a market fruit but the Old Purple Cane. It is uniformly an abundant bearer.

"Reid—Its manner is to propagate by the points of the shoots. This berry used to be cultivated extensively for the New York market."

At the next session of this society, which occurred at Boston in September, 1862, this variety came again under consideration, and elicited the following discussion:

"Prince—I don't see the Purple Cane on the list. The Black Cap, the Yellow Cap and the Purple Cane are the only three raspberries in the world that root from the ends of the branches. A gentleman of Vermont is raising a new variety of the Purple Cane, which promises to be superior to any other of this class.

"President—The Catawissa is another that roots from the end of the shoots.

"Prince—Yes, sir.

"Bergen—Do you know anything about the origin of the Purple Cane?

"Prince—It came from the Catskill Mountains. I found it growing wild there thirty or forty years ago.

"Bergen—Mr. Prince is entirely mistaken in regard to the Purple Cane. It was raised in my vicinity much earlier than thirty years ago.

Prince—The Purple Cane has been cultivated ever since my childhood, at least. I was merely mentioning that I realized its origin when I visited those mountains. I don't mean to say it was originally found thirty years ago. It grows wild all over the north.

"Bergen—The Purple Cane requires no protection on Long Island."

The fact of the tendency of this variety, and also of some more recent ones, such as Ellisdale and Ganargua, to root (somewhat reluctantly) from the tips of the branches, as well as their indisposition to increase by suckers, seem to afford good reasons for referring their parentage to the Black Cap (*Rubus Occidentalis*), while the color of the fruit as well as some of the peculiarities of the wood and foliage indicate a relationship with either *Idæus* or *Strigosus*—circumstances favoring the latter. Many botanists, heretofore, have shown decided disinclination to admit the possibility of hybridization between species apparently even less remote than these, as proof of which we may refer to the wordy contest, so persistently waged over the question of the genuineness of the Rogers, Allen and other alleged hybrids, between *Vitis Vinifera* and *Vitis Labrusca*.

More recently, however, evidences tending to establish the fact of such hybridization, not in the case of the grape only, but also among other classes of plants, have so accumulated that, if we mistake not, the occasional success of such process, whether artificial or accidental, is pretty generally conceded. The fact of the hybrid origin of even one of the varieties of raspberries above named once admitted, we have opened to us a new, and to our apprehension a very promising field of experiment in the production of new and improved varieties of the raspberry, by combining the hardiness, vigor and productiveness of the one with the more delicate flavor, texture and coloring of the other.

STATE FAIR, 1874.

THE POLICY OF HOLDING THE STATE FAIR IN THE SAGINAW VALLEY.

To hold a State fair in the Saginaw Valley, a hundred miles north of the Michigan Central Railroad, north of Lansing, the capital, and north of even the Detroit & Milwaukee Railway, *was* rather a bold undertaking. In the estimation of many it was rash and hazardous, while others esteemed it a wise and true policy, to bring forward the resources of a valley whose influence is bound to be immense, though just beginning to be felt, upon the great agricultural interests of the State.

A State Fair on the banks of the Saginaw River! That was an original, fresh, venturesome enterprise! But the same policy that moved the State Fair from the main Michigan Central line to the Grand River Valley, took it also north to the Saginaw Valley, and we believe that this policy of developing and encouraging the agriculture of the newer counties and the northern portions of the State, meets the cordial approval and co-operation of the people of all sections of the State. It is a policy of life, of development, of progress, of *success*. Yes, **SUCCESS!**

And what is *success*? Let us think of that a moment. It is not the mere dollars received at the gates of a fair. Dollars may be the criterion of success for a circus or a traveling hippodrome. If the receipts of a fair are to be the standard of success, then the fairs held at Grand Rapids in 1873, and at East Saginaw in 1874, were marked successes, for the receipts of the two aggregated near \$70,000, enough for all purposes, enough to pay all bills, all expenses and all premiums, with a handsome surplus left. But we hold it is not the money received that constitutes a successful fair, unless the thousands of men and women who attend it have gone home wiser and better for attending it, stimulated and encouraged to work out the task of life with increased energy, skill, thought, and intelligence, then even the fair may have been a failure, though its receipts were \$100,000. What were the effects of this fair upon the Saginaw Valley?

And what is the Saginaw Valley? One of the largest, the richest and best watered valleys in the State of Michigan. He who for the first time explores it finds himself greatly surprised at its length and breadth, its wealth, capital, resources, industries, and general good prospects.

The Saginaw river is first a curiosity and then a wonder. But few rivers of the same length on the continent can show the same amount of industrial enterprises along its banks that the Saginaw river can show. This Saginaw

country is an unknown and an undiscovered country to one half of the people of Michigan, and it was one good result of the fair to introduce the valley to the people of the State.

"The History of the Saginaws" is the title of a modest, well printed and well written pamphlet, by W. R. Bates, Esq., of the Saginaw land office. We advise every one to buy it or borrow it. It tells a romantic story in a truthful and unpretentious way. To it we are indebted for many facts about the Saginaw river. This river, "formed by the junction of the Tittabawassee, the Cass, the Flint and the Shiawassee rivers, is a large stream, navigable for all steam and sailing vessels upon the lakes excepting only the very largest, and extends nearly north from its head to its mouth at Saginaw bay, having a total length of about eighteen miles. The streams which unite to form the Saginaw, taken together, give over 1,500 miles of river navigation, valuable for the floatage of logs, timber, and lumber, all joining to form the Saginaw. These streams drain an area of over 6,000 square miles, an area greater than Connecticut and Rhode Island, which territory contains a large quantity of excellent pine, ash, elm, hemlock, oak and other valuable timbered lands, and as an agricultural region, though but partially developed, is not excelled by any.

"There are upon the Saginaw river one hundred and twenty-eight mills for lumber and shingles, which cut in 1873 over 600,000,000 feet of lumber, and over 130,000,000 of shingles, besides lath, pickets, etc. The valley also produces a large quantity of round and square timber, staves, hoops, etc., up at St. Louis. Salt was first manufactured in the Saginaw Valley at East Saginaw in 1860, since which time the manufacture has extended up and down the river, and has increased so that in 1873 the product of the valley was 823,340 barrels of salt of 280 lbs. each. The value of the production of the forest products of the valley in 1873, as shown by Headley's carefully prepared annual statement of the business, was \$22,310,468.00, and of Saginaw and Bay counties alone in 1873, \$14,374,000.00.

"About fifteen miles above the mouth of the Saginaw river, upon the west bank, is located the city of Saginaw, and upon the east bank the city of East Saginaw. East Saginaw is the largest city in the valley, and is its *commercial center*; and being located exactly opposite the city of Saginaw and village of Florence, and connected with them by three bridges, besides a railroad bridge, the interests, welfare and prosperity of the municipalities are considered as substantially identical. Taken together as one city, they would make the second city in the State, having a population, as shown by census of 1874, of about 28,000 within a territory not to exceed four and one-half miles square."

Let us go back a step. The State Agricultural Society was organized at Lansing, March 17th, 1849. At that time Saginaw county embraced the following thirteen counties: Tuscola, Midland, Bay, Iosco, Alpena, Cheboygan, Ogemaw, Roscommon, Gratiot, Isabella, Clare, Gladwin and Oscoda. In 1847 the above territory cast two hundred votes. There was but one school house in that territory, not a church, no ministers or lawyers, and but one physician. There were three saw mills,—one at Saginaw City, one at East Saginaw, and one at Portsmouth.

Let it be recollected that at this time,—1849-50, within the life and history of the State Agricultural Society,—the land upon which East Saginaw is built was a wilderness. That where the State fair was held in 1874, forest trees and an unbroken morass was all that met the eye less than twenty-five years ago. So that it *was* a pretty wild thing to hold a State fair on the banks of the Saginaw river!

In this connection it is well to consider that the census of 1874 shows that Saginaw county is ahead of all the old counties in population except Wayne county—ahead of Oakland, or Washtenaw, or Jackson, or Lenawee; ahead of all the new counties, except Kent, and is the third county in the State in population. The population in 1874 of Saginaw county proves to be 48,409, in 1870, 39,098, showing an increase of 9,311 in four years.

We have already stated the fact that the salt interest of the Saginaw is believed to be a successful, permanent, and established interest and resource. There seems to be no exhaustion or failure in the supply. In 1860 the product was 4,000 barrels; in 1870, ten years after, it was 646,516 barrels; in 1873, it was 810,495 barrels. No section of the State, in the Lower Peninsula, can show any such resource. This is permanent, we say. We treat the lumber interest as ephemeral, to exist, perhaps, from twenty-five to fifty years. There is another interest that is just starting in the Saginaw Valley, that is bound to be permanent: we refer to the agricultural interests, including, of course, the horticultural. This is in its infancy, and to encourage it, to instruct it, to quicken and stimulate it, were among the objects of holding the State Agricultural Fair in this great Saginaw Valley.

A State fair should be something beside a *show*; it should be a school of technology; an Agricultural College; a text-book of mechanics, manufactures, and agriculture. It should teach by its models and by its examples. New counties want these as well as the old. The old have them, the new want them.

Respecting the agriculture of this Saginaw Valley, we are again indebted to Mr. Bates for a few remarks, and they are as follows:

OUR FARMING INTERESTS.

“As late as 1860 the general impression in regard to the Saginaw Valley, shared in by many prominent residents as well as by a large majority of those outsiders, who happened to know from observation or experience anything concerning this new region of country, was that while its timber was unquestionably valuable,—at that date this resource was not estimated at one-tenth of its actual value,—by reason of its interminable swamps and marshes, the sterility that ordinarily attaches to land in pine districts,—known at that time to the casual observer as ‘pine barrens,’—the liability to frosts, the lack of drainage and the unusual obstacles to be met with in clearing the forests and making the soil available for cultivation, it could by no possibility ever become even a moderately productive farming district. There were grave doubts at that time in the minds of many fair-minded, excellent citizens, gentlemen thoroughly identified with the interests of the valley, whether Gratiot county, which has become already as it were a garden, and Tuscola county, many portions of which are to-day as rich and productive as the best agricultural districts in the west, were not too frosty and unreliable as to climate to warrant the broad extent of farming improvements that had already been vigorously inaugurated in these counties, and concerning ‘the shore,’ the counties of Bay, Midland, and Isabella, there was by no means ‘faith like unto a grain of mustard seed’ in this direction.

“This doubt, and the persistent misrepresentation in regard to Saginaw Valley, as a land of swamps, frosts and sterility, made previous to 1860, has seemed to keep the farming interest, never too prone to prosper in a lumber country, far behind what it should be at this time, and the loss in accumulations by reason of this delay may be counted by millions of dollars; but with

all this slow progress, these facts have been fairly and firmly fixed. The last four years have shown more actual business in the way of making farms, than all the previous years from 1850 to 1870, and at the same ratio the value of actual product of the valley, from all sources, by means of the addition from this specialty, will be doubled within the next five years.

"The soil throughout all that range of counties drained by Saginaw river and its tributaries, is as a rule excellent for farming purposes, and among some of the pine tracts, as is the case on the Cass, the Flint, the Tittabawassee, Chippewa and other streams, is found some of the most productive lands in the district.

"As lands are cleared and opened to the light and heat of the sun, they improve every year, and in the broader clearings untimely frosts are so marked an exception to the general rule, that there is no further fear of that dread bug-bear.

"The certainty of an eager market for all classes of products is an inducement that encourages those already in the business to work all available territory, and for farmers from abroad seeking a favorable point to commence business in this line, to locate where no difficulties in the way of transportation or slack demand are liable to prevent a regularly remunerative return with each recurring year.

"As showing the rate of progress for ten years, we give the following comparative statement in regard to Saginaw county:

1860.

Acres improved land.....	18,048
Value of crops.....	\$165,380

1870.

Acres improved.....	33,385
Value of crops.....	\$690,382

"The increase in acres of improved land, and in the value of crops since 1870, has been at least 100 per cent; and when we consider that the land rated as improved in 1860 was in many instances only slashed, as the product shows, the ratio is certainly sufficiently encouraging. The value of the dairy product and increase in horses, cattle and other stock, is not given in this statement. A fair estimate, therefore, of the entire prospective farm product of Saginaw county for 1874, is not less than \$2,000,000. We give further the following statement in regard to the other valley counties, as shown by the census of 1870, premising with the explanation that in 1860 there were no farm improvements to speak of in Alpena, Alcona, Iosco or Cheboygan, and but few in other counties save Gratiot and Tuscola, whereof we have no data:

	Acres improved.	Value product.
Bay.....	7,645	\$181,406
Alpena.....	502	12,758
Alcona.....	319	7,245
Gratiot.....	46,879	782,911
Iosco.....	647	10,203
Midland.....	5,252	123,205
Cheboygan.....	1,423	37,714
Tuscola.....	48,400	833,920
Isabella.....	15,077	265,050

"It requires little demonstration of this character to show that this is no ephemeral section. Agriculture, the great and enduring interest of all, save the mining portions of our State, is ours to be wrought out to the extent of a leading business, as soon as its importance shall be fully and rightly considered. Our saline deposits are a permanent resource, incalculable and inexhaustible. Timber is the capital wherewith these will be developed, and the accumulations of all secured; but, as any thinking man seems now to understand, the chief matter of care and solicitude, and that which is by common consent being pushed most earnestly throughout the whole Valley, is the farming interest."

It was to help push this "farming interest" that the State fair was located on the Saginaw river. The future will sustain this policy. The success of this policy will depend mainly upon the good sense of the people of the valley. If they appreciate the fact that this "farming interest" is a good thing to fall back upon, that wheat, corn, and potatoes, stock of all kinds, with fruits and flowers, mix in well with salt and lumber, and that a Diversified Industry is the true destiny of the Saginaw Valley, then will the policy of locating the State fair for 1874 and 1875 in its midst, be most signally and triumphantly vindicated.

REGISTER OF ENTRIES, POMOLOGICAL DEPARTMENT, STATE FAIR, 1874.

ORCHARDS AND VINEYARDS.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
July 28.	A.	41	1	General Nursery.....	I. E. Ilgenfritz & Co.....	Monroe.
" 28.	"	2	2	Apple Orchard.....	N. E. Smith.....	Ionla.
" 28.	"	10	3	Peach Orchard in bearing.....	" ".....	"
" 28.	"	21	4	Concord Vineyard.....	" ".....	"
" 28.	"	22	5	Delaware Vineyard.....	" ".....	"
" 28.	"	14	6	Elton Cherry Orchard.....	George Parmelee.....	Old Mission.
" 28.	"	3	7	Apple Orchard (5 ac. G'd'n Rus't)	" ".....	"
" 28.	"	Spec'l	8	Pear Orchard (10 acres for gen. use)	" ".....	"
" 29.	"	16	9	Quince Orchard.....	C. Engle.....	Paw Paw.
" 29.	"	6	10	Pear Orchard.....	" ".....	"
" 29.	"	8	11	Peach Orchard, Early Crawford.....	" ".....	"
" 29.	"	9	12	" " Late Crawford.....	" ".....	"
" 29.	"	9	13	" " Hill's Chili.....	" ".....	"
" 29.	"	8	14	" ".....	" ".....	"
" 29.	"	2	15	Apple ".....	J. B. Soule.....	Fruitport.
" 29.	"	10	16	Peach ".....	" ".....	"
" 29.	"	34	17	Grapery, foreign varieties.....	Artimus Sigler.....	Adrian.
Aug. 11.	"	4	18	Apple Orchard.....	Joseph Gridley.....	Kalamo.
" 11.	"	3	19	" ".....	" ".....	"
" 11.	"	17	20	Vineyard.....	N. & C. Chilson.....	Battle Creek.
" 11.	"	33	21	Suburban Residence.....	S. O. Knapp.....	Jackson.
" 11.	"	38	22	Collection Growing Shrubs.....	" ".....	"
" 11.	"	39	23	Private Plant House.....	" ".....	"
" 11.	"	9	24	Peach Orchard.....	Hunter Savidge.....	Spring Lake.
" 11.	"	9	25	" ".....	Frank Hall.....	"
" 11.	"	9	26	" ".....	Thomas Petty.....	"
" 11.	"	9	27	" ".....	Theodore Curtis.....	"
" 11.	"	9	28	" ".....	A. L. Soule.....	"
" 15.	"	12	29	Plum ".....	Peter Collar.....	Adrian.
" 15.	"	2	30	Apple ".....	" ".....	"
" 15.	"	28	31	Plat Red Raspberries.....	George Parmelee.....	Old Mission.
" 15.	"	14	32	Cherry Orchard, Morello.....	" ".....	"
" 15.	"	2	33	Apple Orchard.....	A. R. Sherburne.....	Deerfield.
" 15.	"	1	34	" ".....	William Marshall.....	Old Mission.
" 15.	"	2	35	" ".....	" ".....	"
" 15.	"	34	36	Garden.....	Dr. S. J. Hutchinson.....	Northport.
" 15.	"	1	37	Apple Orchard.....	Windsor Golden.....	Old Mission.
" 15.	"	2	38	" ".....	Mr. Savage.....	"
" 15.	"	3	39	" ".....	" ".....	"

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Aug. 15.	"	4	40	Apple Orchard.....	Mr. Alliston.....	Old Mission.
" 15.	"	5	41	Specimen Orchard, 58 varieties.....	Reynolds & Tracey.....	" "
" 15.	"	12	42	Plum Orchard.....	Mr. Barney.....	" "
" 15.	"	13	43	".....	Mr. McCallum.....	" "
" 15.	"	3	44	Apple.....	Wm. Tompkins.....	" "
" 15.	"	34	45	Garden.....	E. F. Guild.....	East Saginaw.
" 15.	"	3	46	Apple Orchard.....	A. K. Montague.....	Old Mission.
" 15.	"	24	47	Pointe aux Peaux Vineyard.....	J. M. Sterling.....	Monroe.
" 15.	"	21	48	Snake Isle Vineyard.....	Geo. W. Bruckner.....	" "
" 15.	"	28	49	Raisin Valley Vineyard.....	".....	" "
" 15.	"	23	50	Henrietta Vineyard.....	Henrietta Bruckner.....	" "
" 15.	"	17	51	Vineyard.....	Antoine Wier.....	" "
" 15.	"	20	52	".....	Thomas Doyle.....	" "
" 15.	"	41	53	General Nursery.....	John Greening.....	" "
" 15.	"	10	54	Peach Orchard for profit.....	Joseph Gridley.....	Kalamo.
" 15.	"	34	55	Grape Garden, attached to city res.....	John C. Ziegler.....	Saginaw City.

FRUITS AND FLOWERS.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 5.	P.	4	1	Collection Begonias.....	I. Dyckman.....	East Saginaw.
" 5.	"	2	2	" Caladiums.....	".....	" "
" 5.	Q.	1	3	" Greenhouse Plants.....	".....	" "
" 5.	"	2	4	" Fuchsias.....	".....	" "
" 5.	"	3	5	" Roses.....	".....	" "
" 5.	"	4	6	" Ornamental P'd Geran's.....	".....	" "
" 5.	"	6	7	" Colored Foliage Plants.....	".....	" "
" 5.	"	8	8	" Cacti.....	".....	" "
" 5.	"	23	9	Specimen Plant of Stevia.....	".....	" "
" 5.	"	24	10	" Tuberose.....	".....	" "
" 5.	"	30	11	" Lycopodium.....	".....	" "
" 5.	R.	22	12	Hanging Basket, filled.....	".....	" "
" 5.	S.	13	13	Collection Verbenas.....	".....	" "
" 5.	"	4	14	" Geraniums.....	".....	" "
" 5.	"	6	15	" Lantanas.....	".....	" "
" 5.	"	11	16	" Dianthus.....	".....	" "
" 5.	"	15	17	" German Stock.....	".....	" "
" 5.	"	18	18	" Zenias.....	".....	" "
" 5.	"	19	19	" Everlasting Flowers.....	".....	" "
" 5.	"	22	20	" Phlox Drummondii.....	".....	" "
" 5.	"	25	21	" Scabiosa.....	".....	" "
" 5.	T.	5	22	Pair Boq'ts, ar'ged in frm'm'th'd.....	".....	" "
" 5.	"	8	23	Boq't of Dried Grasses & Flowers.....	".....	" "
" 5.	"	9	24	Hanging Basket of Cut Flowers.....	".....	" "
" 5.	J.	4	25	Plate Duane's Purple Plum.....	L. P. Mason.....	" "
" 5.	R.	23	26	Wardian Case, filled.....	Egbert F. Guild.....	" "
" 7.	Q.	24	27	Specimen Plant, Tuberose.....	Fred. H. Herbert.....	" "
" 7.	"	9	28	Collection Tuberose.....	".....	" "
" 7.	"	17	29	Specimen Plant, Calla.....	".....	" "
" 7.	P.	4	30	Collection Foliage Begonias.....	".....	" "
" 7.	"	5	31	" Coleus.....	".....	" "
" 7.	Q.	2	32	" Fuchsias.....	".....	" "
" 7.	"	10	33	Specimen Plant, Fuchsia.....	".....	" "
" 7.	J.	17	34	Plate Lawrence's Favorite Plum.....	L. P. Mason.....	" "
" 7.	H.	18	35	Grape, Rogers No. 4.....	".....	" "
" 7.	"	18	36	" " 15.....	".....	" "
" 7.	"	9	37	" Iona.....	".....	" "
" 7.	"	11	38	" Diana.....	".....	" "
" 11.	R.	7	39	Specimen Plant of Aloe.....	Fred. H. Herbert.....	" "
" 11.	B.	4	40	Co. Col. Grapes (Saginaw Co.).....	Geo. P. Butler.....	" "
" 11.	P.	4	41	Collection Foliage Begonias.....	Mrs. Alicia Forsyth.....	Saginaw City.
" 11.	"	5	42	Gesnerius Collection.....	".....	" "
" 11.	"	11	43	Specimen Plant, Cissus.....	".....	" "
" 11.	Q.	10	44	" Cacti.....	".....	" "
" 11.	"	31	45	Night-Blooming Cereus.....	".....	" "
" 11.	"	8	46	Collection Cacti.....	".....	" "
" 11.	"	13	47	Specimen Plant, Abutilon.....	".....	" "
" 11.	P.	17	48	Night-Blooming Jasminum.....	".....	" "
" 11.	Q.	11	49	Specimen Myrtle.....	".....	" "
" 11.	R.	23	50	Wardian Case filled, or fernery.....	".....	" "
" 11.	"	20	51	Collection Native Ferns.....	".....	" "
" 11.	S.	6	52	" Lantanas.....	".....	" "
" 11.	R.	7	53	Specimen of Aloe.....	".....	" "

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 11.	R.	1	54	Collection House Plants.....	Mrs. Alicia Forsyth.....	Saginaw City.
" 11.	"	5	55	Specimen Scented Geranium.....	" ".....	" "
" 11.	Q.	31	56	" Plant, <i>Ferugium Grandi</i>	" ".....	" "
" 11.	Spe cial.	57	57	Globe Fernery.....	" ".....	" "
" 11.	Q.	29	58	Specimen Plant of Fern.....	" ".....	" "
" 11.	"	30	59	" " Lycopodium.....	" ".....	" "
" 11.	R.	16	60	" " Flow'ring Begonia.....	" ".....	" "
" 11.	"	17	61	" " Hoya.....	" ".....	" "
" 11.	Q.	31	62	" " Seedum.....	" ".....	" "
" 11.	"	30	63	Air Plant.....	" ".....	" "
" 11.	N.	5	64	Concord Wine (sweet).....	" ".....	" "
" 11.	"	11	65	Catawba Wine (sweet).....	" ".....	" "
" 11.	"	12	66	Wild Grape Wine (sweet).....	" ".....	" "
" 11.	"	13	67	Currant Wine (sweet).....	" ".....	" "
" 11.	E.	21	68	Plate Hawley Apples.....	Thomas Wilde.....	Berlin.
" 11.	"	38	69	" Wagener Apples.....	" ".....	" "
" 11.	F.	15	70	" Flemish Beauty Pears.....	" ".....	" "
" 11.	"	31	71	" Louise Bonne d' Jersey Pears.....	" ".....	" "
" 11.	I.	5	72	" Seedling Peaches.....	" ".....	" "
" 11.	S.	1	73	Collection of Verbenas.....	" ".....	" "
" 11.	"	2	74	" Dahlias.....	" ".....	" "
" 11.	"	10	75	" Asters.....	" ".....	" "
" 11.	"	15	76	" German Stocks.....	" ".....	" "
" 11.	"	18	77	" Zenias.....	" ".....	" "
" 11.	"	21	78	" Coxcombs.....	" ".....	" "
" 11.	"	22	79	" Phlox Drummondii.....	" ".....	" "
" 11.	T.	5	80	Pair Bo'q'ts, ar'ged in frm'l m'th'd.....	" ".....	" "
" 11.	"	6	81	Pair Boquets, arranged in natural and graceful style.....	" ".....	" "
" 11.	"	11	82	Dish or Basket Cut Flowers.....	" ".....	" "
" 11.	V.	Vick's	83	Collection Cut Flowers, from seeds grown by James Vick.....	" ".....	" "
" 11.	Spe cial.	84	84	Night-Blooming Cereus, preserved in alcohol.....	Mrs. Alicia Forsyth.....	Saginaw City.
" 11.	R.	7	85	Specimen Plant, Agava Americana.....	Mrs. Amos S. Parke.....	East Saginaw.
" 11.	"	16	86	Flowering Begonia.....	" ".....	" "
" 11.	"	10	87	Specimen Plant, Abutilon.....	" ".....	" "
" 11.	"	11	88	" Aloysia.....	" ".....	" "
" 11.	"	3	89	" " Tea Rose (Madam Ristori).....	" ".....	" "
" 11.	"	19	90	" " Pimento.....	" ".....	" "
" 11.	"	23	91	Wardian Case, filled.....	" ".....	" "
" 11.	"	23	92	" ".....	" ".....	" "
" 11.	Q.	1	93	Collection Greenhouse Plants.....	" ".....	" "
" 11.	"	7	94	" Agavia Aloes, 6 variet's.....	" ".....	" "
" 11.	"	8	95	" Cacti, 17 varieties.....	" ".....	" "
" 11.	"	20	96	Spec'n Pl't, <i>Jasminum Grandiflora</i>	" ".....	" "
" 11.	"	31	97	" <i>Echeveria Grandiflora</i>	" ".....	" "
" 11.	"	31	98	" <i>Echeveria Lutea Gigantea</i>	" ".....	" "
" 11.	"	31	99	" <i>Echeveria Secunda Glauca</i>	" ".....	" "
" 11.	"	23	100	" Plant of <i>Stevia</i>	" ".....	" "
" 11.	"	31	101	<i>Eupatorium Odorata</i>	" ".....	" "
" 11.	"	31	102	<i>Veronica</i>	" ".....	" "
" 11.	"	31	103	<i>Plumbago Capensis</i>	" ".....	" "
" 11.	"	31	104	<i>Launtnus Grandiflora</i>	" ".....	" "
" 11.	"	31	105	<i>Ficus Elastica</i>	" ".....	" "
" 11.	"	31	106	<i>Poinsetta</i>	" ".....	" "
" 11.	"	31	107	<i>Collen* Chernelon</i>	" ".....	" "
" 11.	"	31	108	<i>Amarjellis</i>	" ".....	" "
" 11.	"	31	109	<i>Habrothaneus Elegans</i>	" ".....	" "
" 11.	"	31	110	<i>Sedam, Sebaldi variety</i>	" ".....	" "
" 11.	"	31	111	<i>Herbethisum Inthinum</i>	" ".....	" "
" 11.	"	31	112	Bearing Lemon Tree.....	" ".....	" "
" 11.	"	31	113	Lemon Tree (specimen).....	" ".....	" "
" 11.	"	31	114	<i>Perestrophe Agulifolia</i>	" ".....	" "
" 11.	"	31	115	Specimen Plant, <i>Hibiscus</i>	" ".....	" "
" 11.	"	31	116	<i>Celia scandus</i>	" ".....	" "
" 11.	"	28	117	Specimen Plant of Palm.....	" ".....	" "
" 11.	"	31	118	Night-Blooming <i>Jasminum</i>	" ".....	" "
" 11.	"	31	119	<i>Brigantia</i>	" ".....	" "
" 11.	"	31	120	<i>Euphorbia Splendens</i>	" ".....	" "
" 11.	"	31	121	<i>Saxifraga Tricolor</i>	" ".....	" "
" 11.	"	31	122	<i>Livonia Flouhunda</i>	" ".....	" "
" 11.	"	3	123	Collection of Roses.....	" ".....	" "
" 11.	"	9	124	" Dwarf Geraniums.....	" ".....	" "
" 11.	P.	17	125	<i>Arabas</i> (specimen).....	" ".....	" "
" 11.	"	17	126	Specimen Plant, <i>Gesenaria</i>	" ".....	" "
" 11.	T.	1	127	Floral design for decoration of large room or hall.....	" ".....	" "

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	DIV.	CLASS.	NO.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 11.	D.	1	128	Col. of Fruit, grown by exhibitor.	David Geddes.....	Saginaw City.
" 11.	N.	13	129	Black Currant Wine, 14 years old.	Mrs. J. B. White.....	" "
" 11.	"	15	130	Elderberry Wine, 3 years old.	" "	" "
" 11.	"	16	131	Bottled Cider (2 bottles) 3 y'rs old	" "	" "
" 11.	"	13	132	Red Currant Wine, 1 year old.	" "	" "
" 11.	L.	6	133	Canned Plums.....	" "	" "
" 11.	"	13	134	Canned Quinces.....	" "	" "
" 12.	F.	3	134½	Plate Autumn Pears.....	H. B. Chapman.....	Reading.
" 12.	"	28	135	" Winter Nelis.....	" "	" "
" 12.	"	31	136	" Glout Morceau Pears.....	" "	" "
" 12.	"	13	137	" Bartlett Pears.....	" "	" "
" 12.	"	15	138	" Flemish Beauty Pears.....	" "	" "
" 12.	"	17	139	" Onondaga Pears.....	" "	" "
" 12.	"	18	140	" White Doyenne Pears.....	" "	" "
" 12.	"	21	141	" Sheldon Pears.....	" "	" "
" 12.	"	31	142	" Louise Bon d'Jersey Pears.....	" "	" "
" 12.	"	31	143	" Fulton Pears.....	" "	" "
" 12.	"	31	144	" Stephens Genesee Pears.....	" "	" "
" 12.	"	31	145	" Lodge Pears.....	" "	" "
" 12.	"	31	146	" Belle Lucrative Pears.....	" "	" "
" 12.	"	31	147	" Delices d'Hardenpoint Pears.....	" "	" "
" 12.	"	31	148	" Compté Deloma Pears.....	" "	" "
" 12.	G.	27	149	" Tuft's Rarripe Peach.....	" "	" "
" 12.	"	27	150	" Favorite Peach.....	" "	" "
" 12.	"	8	151	" Early Crawford Peach.....	" "	" "
" 12.	"	12	152	" Plate Late Crawford Peaches.....	" "	" "
" 12.	"	27	153	" East Window Seedling P'ch's.....	" "	" "
" 12.	"	27	154	" North Door Seedling P'ches.....	" "	" "
" 12.	L.	Spec'l	155	Bottle Celery Sauce.....	" "	" "
" 12.	N.	Spec'l	156	Raspberry Syrup or Vinegar.....	" "	" "
" 12.	"	Spec'l	157	Strawberry Syrup or Vinegar.....	" "	" "
" 12.	"	11	158	Bottle Grape Wine.....	" "	" "
" 12.	"	16	159	" Sour Cider, 4 years old.....	" "	" "
" 12.	"	16	160	" Sweet Cider, 4 years old.....	" "	" "
" 12.	L.	33	161	" Tomato Catsup.....	" "	" "
" 12.	"	Spec'l	162	" Mixed Pickles.....	" "	" "
" 12.	S.	9	163	Col. and display of Petunias.....	Mrs. D. F. Rose.....	East Saginaw.
" 12.	"	22	164	" Phlox Drum'di.....	" "	" "
" 12.	T.	Spec'l	165	Flat Bouquet.....	" "	" "
" 12.	"	Spec'l	167	Round Bouquet.....	" "	" "
" 12.	L.	5	168	Canned Peaches.....	" "	" "
" 12.	M.	4	169	Canned Preserved Peaches.....	" "	" "
" 12.	L.	23	170	Spiced Peaches.....	" "	" "
" 12.	"	6	171	Can of Canned Plums.....	" "	" "
" 12.	S.	1	172	Col. and display of Verbenas.....	L. P. Mason.....	East Saginaw.
" 12.	"	10	173	" " Asters.....	" "	" "
" 12.	"	22	174	" " Phlox Drum'di.....	" "	" "
" 12.	T.	6	175	P'r Bouq'ts, arranged in nat'l style.....	" "	" "
" 12.	"	Spec'l	176	Flat Bouquet.....	" "	" "
" 12.	B.	1	177	County Col. of Apples (Eaton Co.).....	Joseph Gridley.....	Kalamo.
" 12.	C.	1	178	Township Col. of Apples (Kalamo).....	" "	" "
" 12.	D.	1	179	Collection of Fruit, gr'n by exhib'r.....	" "	" "
" 12.	E.	1	180	Collect'n of Apples, gr'n by exhib'r, nomenclature, quality, and success'n to be main consideration.....	" "	" "
" 12.	S.	Spec'l	181	Castor Bean.....	Frederick Harris.....	East Saginaw.
" 12.	M.	19	182	Currant Jelly.....	John Shepherd.....	Saginaw City.
" 12.	"	23	183	Raspberry Jelly.....	" "	" "
" 12.	"	24	184	Blackberry Jelly.....	" "	" "
" 12.	"	25	185	Crab Apple Jelly.....	" "	" "
" 12.	N.	13	186	Bottle Currant Wine.....	" "	" "
" 12.	"	11	187	" Raspberry Wine.....	" "	" "
" 12.	R.	19	188	Sea Onion, specimen plant.....	Mrs. Julia Bare.....	East Saginaw.
" 12.	N.	18	189	Cider Vinegar.....	Mrs. A. W. Wright.....	Saginaw City.
" 12.	T.	11	190	Basket of Cut Flowers.....	" "	" "
" 12.	"	6	191	P'r Bouq'ts, arranged in nat'l style.....	I. Dyckman.....	East Saginaw.
" 12.	N.	14	192	Blackberry Wine.....	P. Allyn.....	Traverse City.
" 14.	"	11	193	Red Raspberry Wine.....	" "	" "
" 14.	"	Spec'l	194	Blackberry Vinegar.....	" "	" "
" 14.	"	"	195	Red Raspberry Vinegar.....	" "	" "
" 14.	"	"	196	Black Raspberry Vinegar.....	" "	" "
" 14.	"	"	197	Black Raspberry Shrub.....	" "	" "
" 14.	"	"	198	Blackberry Shrub.....	" "	" "
" 14.	"	"	199	Red Raspberry Shrub.....	" "	" "
" 14.	M.	1	200	Col. of Preserved Fruits and Jellies.....	" "	" "
" 14.	H.	1	201	" House Plants.....	Mrs. Chas. F. Weber.....	East Saginaw.
" 14.	"	1	202	" Native Grapes.....	Pt. aux Peaux Grape W. Co.....	Monroe.
" 14.	"	3	203	Five bunches Martha Grapes.....	" "	" "
" 14.	"	4	204	" " H'rd Prolific Grapes.....	" "	" "

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 14.	H.	6	205	Five bunches Delaware Grapes.....	Pt. aux Peaux Grape W. Co.	Monroe.
" 14.	"	7	206	" " Israella Grapes.....	" " " "	" "
" 14.	"	8	207	" " Concord Grapes.....	" " " "	" "
" 14.	"	9	208	" " Iona Grapes.....	" " " "	" "
" 14.	"	10	209	" " Ives Seedling Grapes.....	" " " "	" "
" 14.	"	11	210	" " Diana Grapes.....	" " " "	" "
" 14.	"	19	211	Plate of Grapes for Wine.....	" " " "	" "
" 14.	"	20	212	" " Catawba Grapes.....	" " " "	" "
" 14.	B.	4	213	County Col. of Grapes (Monroe Co.).....	" " " "	" "
" 14.	C.	4	214	T'nship Col. of Grapes (French'tn).....	" " " "	" "
" 14.	H.	1	215	Collection of Native Grapes.....	J. C. Sterling.....	" "
" 14.	"	3	216	Five bunches Martha Grapes.....	" " " "	" "
" 14.	"	4	217	" " H't'd Prolific Grapes.....	" " " "	" "
" 14.	"	6	218	" " Delaware Grapes.....	" " " "	" "
" 14.	"	8	219	" " Concord Grapes.....	" " " "	" "
" 14.	"	9	220	" " Iona Grapes.....	" " " "	" "
" 14.	"	10	221	" " Ives Seedling Grapes.....	" " " "	" "
" 14.	"	11	222	" " Diana Grapes.....	" " " "	" "
" 14.	"	19	223	Plate of Grapes for Wine.....	" " " "	" "
" 14.	"	20	224	" " Catawba Grapes.....	" " " "	" "
" 14.	C.	4	225	Township Col. of Grapes (Monroe).....	" " " "	" "
" 14.	H.	1	226	Collection Native Grapes.....	W. C. Sterling.....	" "
" 14.	"	3	227	Five bunches Martha Grapes.....	" " " "	" "
" 14.	"	4	228	" " H't'd Prolific Grapes.....	" " " "	" "
" 14.	"	6	229	" " Delaware Grapes.....	" " " "	" "
" 14.	"	7	230	" " Israella Grapes.....	" " " "	" "
" 14.	"	8	231	" " Concord Grapes.....	" " " "	" "
" 14.	"	10	232	" " Ives Seedling Grapes.....	" " " "	" "
" 14.	"	11	233	" " Diana Grapes.....	" " " "	" "
" 14.	"	14	234	" " Creveling Grapes.....	" " " "	" "
" 14.	"	19	235	Plate of Grapes for Wine.....	" " " "	" "
" 14.	"	20	236	" " Catawba Grapes.....	" " " "	" "
" 14.	Q.	15	237	Spec. Pl't, Bigronia tr'n'd to tr'l'is.....	Mrs. Amos S. Parke.....	East Saginaw.
" 14.	S.	14	238	Two Tritomas.....	" " " "	" "
" 14.	R.	Spec'l	239	Garden Vase, filled.....	" " " "	" "
" 14.	M.	19	240	Currant Jelly.....	Mrs. J. B. White.....	Saginaw City.
" 14.	"	25	241	Spiced Currant Jelly.....	" " " "	" "
" 14.	"	12	242	Preserved Currant, or Currant Jam.....	" " " "	" "
" 14.	N.	17	243	Boiled Cider, 3 years old.....	" " " "	" "
" 14.	J.	17	244	Plums, for name.....	M. C. Mower.....	East Saginaw.
" 14.	"	17	245	" " " "	" " " "	" "
" 14.	"	17	246	" " " "	" " " "	" "
" 14.	H.	8	247	Five bunches Concord Grapes.....	Ernst Herpel.....	Taymouth.
" 14.	"	6	248	" " Delaware Grapes.....	" " " "	" "
" 14.	"	18	249	" " Elba Grapes.....	" " " "	" "
" 14.	R.	13	250	Specimen Pl't, Nerium (oleander).....	I. Dyckman.....	East Saginaw.
" 14.	C.	1	251	Township Col. of Apples (Walker).....	Wm. Rowe.....	Walker.
" 14.	E.	1	252	Col. of Apples, grown by exhibit'r.....	I. E. Ilgenfritz & Co.....	Monroe.
" 14.	"	2	253	Single variety Summer Apples.....	" " " "	" "
" 14.	"	3	254	" " Autumn Apples.....	" " " "	" "
" 14.	"	4	255	" " Winter Apples.....	" " " "	" "
" 14.	"	13	256	Plate Early Strawberry Apples.....	" " " "	" "
" 14.	"	16	257	" " Lowell (Greasy Pippin).....	" " " "	" "
" 14.	"	17	258	" " Porter Apples.....	" " " "	" "
" 14.	"	18	259	" " Keswick Codlin.....	" " " "	" "
" 14.	"	19	260	" " 20-oz. (Cayuga Red-Streak).....	" " " "	" "
" 14.	"	25	261	" " Fall Pippin.....	" " " "	" "
" 14.	"	26	262	" " Ohio Nonpareil.....	" " " "	" "
" 14.	"	31	263	" " Jonathan.....	" " " "	" "
" 14.	"	32	264	" " Peck's Pleasant.....	" " " "	" "
" 14.	"	33	265	" " Rhode Island Greening.....	" " " "	" "
" 14.	"	34	266	" " Baldwin Apples.....	" " " "	" "
" 14.	"	35	267	" " Red Canada Apples.....	" " " "	" "
" 14.	"	36	268	" " Golden Russet Apples.....	" " " "	" "
" 14.	"	37	269	" " Roxbury Russet Apples.....	" " " "	" "
" 14.	"	38	270	" " Wagener Apples.....	" " " "	" "
" 14.	"	39	271	" " Northern Spy Apples.....	" " " "	" "
" 14.	"	40	272	" " Belmont Apples.....	" " " "	" "
" 14.	"	41	273	" " Fameuse (Known as Snow).....	" " " "	" "
" 14.	"	43	274	" " Westfield Seek-no-further.....	" " " "	" "
" 14.	"	45	275	" " King of Tompkins County.....	" " " "	" "
" 14.	"	46	276	" " Yellow Bellflower.....	" " " "	" "
" 14.	"	47	277	" " Talman Sweet.....	" " " "	" "
" 14.	"	50	278	" " Grimes' Golden.....	" " " "	" "
" 14.	"	52	279	" " Esopus Spitzenberg.....	" " " "	" "
" 14.	"	54	280	" " " "	" " " "	" "
" 14.	F.	1	281	Col. of Pears, grown by exhibit'r.....	" " " "	" "
" 14.	"	2	282	Plate Summer Pears, one variety.....	" " " "	" "
" 14.	"	3	283	" " Autumn Pears.....	" " " "	" "

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 14.	F.	4	284	Plate Winter Pears.	I. E. Ilgenfritz & Co.	Monroe.
" 14.	"	13	285	" Bartlett Pears.	" " "	"
" 14.	"	14	286	" Buffum Pears.	" " "	"
" 14.	"	15	287	" Flemish Beauty Pears.	" " "	"
" 14.	"	17	288	" Onondaga Pears.	" " "	"
" 14.	"	18	289	" White Doyenne Pears.	" " "	"
" 14.	"	19	290	" Beurre d'Anjou Pears.	" " "	"
" 14.	"	21	291	" Sheldon Pears.	" " "	"
" 14.	"	23	292	" Fondante d'Automne.	" " "	"
" 14.	"	26	293	" Lawrence Pears.	" " "	"
" 14.	"	27	294	" Beurre Diel Pears.	" " "	"
" 14.	"	28	295	" Winter Nelis Pears.	" " "	"
" 14.	"	29	296	" Beurre Clairgeau Pears.	" " "	"
" 14.	"	30	297	" Doyenne d'Boussock Pears.	" " "	"
" 14.	"	31	298	"	" " "	"
" 14.	C.	1	299	Township Col. of Apples (Peninsular township, Gr. Traverse Co.)	Peninsular Farmers' Club.	Old Mission.
" 14.	T.	Spec'l	300	Col. of Ornamental Moss Goods.	Mrs. Barbara Kellerman.	New Buffalo.
" 14.	"	8	301	Bouq't of Dried Grasses & Flowers	" " "	"
" 14.	"	4	302	Floral Design	" " "	"
" 14.	"	7	303	Basket of Flowers for Table	" " "	"
" 14.	L.	8	304	Transcendent Crab Apple.	L. C. Lincoln.	Greenville.
" 14.	"	15	305	Canned Currants	" " "	"
" 14.	"	18	306	" Tomatoes.	" " "	"
" 14.	"	11	307	" Blackberries	" " "	"
" 14.	"	29	308	Pickled Tomatoes	" " "	"
" 14.	M.	4	309	Preserved Peaches	" " "	"
" 14.	"	9	310	" Blackberries.	" " "	"
" 14.	"	15	311	" Crab Apples.	" " "	"
" 14.	"	16	312	" Tomatoes.	" " "	"
" 14.	"	Spec'l	313	" Ground Cherries.	" " "	"
" 14.	"	21	314	Jelly, Crab Apple.	" " "	"
" 14.	K.	3	315	Domestic Dried Fruit.	" " "	"
" 14.	"	22	316	Dried Crab Apples	" " "	"
" 14.	M.	Spec'l	317	Lemon, preserved in alcohol	C. W. Monroe	Bay City.
" 14.	Q.	9	318	Collection of Abutilons.	Mrs. Alicia Forsyth.	Saginaw City.
" 14.	N.	12	319	Wild Grape Wine.	Mrs. E. Dunston	Clarkston.
" 14.	"	17	320	Boiled Cider	" " "	"
" 14.	"	18	321	Cider Vinegar	" " "	"
" 14.	M.	18	322	Collection of Jellies.	Mrs. James Bolton.	East Saginaw.
" 14.	"	8	323	Preserved Red Raspberries	" " "	"
" 14.	L.	10	324	Canned Red Raspberries	" " "	"
" 14.	K.	14	325	Dried Currants	" " "	"
" 14.	E.	55	326	Collection Siberian Crab Apples	" " "	"
" 14.	N.	14	327	Blackberry Wine	" " "	"
" 14.	P.	5	328	"	" " "	"
" 14.	H.	7	329	Five bunches Israella Grapes.	John C. Ziegler.	Saginaw City.
" 14.	"	18	330	Collection Rogers, No. 16.	" " "	"
" 14.	"	18	331	Isabella Grapes.	" " "	"
" 14.	"	18	332	Union Village Grapes.	" " "	"
" 14.	"	9	333	Five bunches Iona Grapes	" " "	"
" 14.	"	20	334	Plate Catawba Grapes	" " "	"
" 14.	"	18	335	Clinton Grapes.	" " "	"
" 14.	"	8	336	Concord Grapes.	" " "	"
" 14.	"	18	337	Muscadine Grapes.	" " "	"
" 14.	N.	5	338	Concord Wine	" " "	"
" 14.	"	4	339	Clinton Wine	" " "	"
" 14.	"	13	340	Black Currant Wine.	" " "	"
" 14.	"	11	341	Black Raspberry Wine.	" " "	"
" 15.	E.	8	342	Plate of Maiden's Blush Apples.	William Rowe	Walker.
" 15.	"	32	343	" Peck's Pleasant Apples.	" " "	"
" 15.	"	34	344	" Baldwin Apples.	" " "	"
" 15.	"	35	345	" Red Canada Apples.	" " "	"
" 15.	"	36	346	" Golden Russet Apples.	" " "	"
" 15.	"	38	347	" Wagener Apples.	" " "	"
" 15.	"	39	348	" Northern Spy Apples.	" " "	"
" 15.	"	41	349	" Fameuse (known as Snow).	" " "	"
" 15.	"	43	350	" Seek-no-further.	" " "	"
" 15.	"	44	351	" Hubbardston Nonsuch.	" " "	"
" 15.	"	45	352	" King of Tompkins Co. Apples	" " "	"
" 15.	"	18	353	" Keswick Codlin Apples.	" " "	"
" 15.	"	54	354	" Rambo Apples.	" " "	"
" 15.	"	56	355	" S'gle v'ty Siberi'n Cr'b A'pl's	" " "	"
" 15.	"	57	356	Transcendent Crab Apples.	" " "	"
" 15.	"	59	357	Montreal Beauty Apples.	" " "	"
" 15.	F.	18	358	Plate Bartlett Pears.	" " "	"
" 15.	"	15	359	" Flemish Beauty Pears.	" " "	"
" 15.	"	16	360	" Sockel Pears.	" " "	"
" 15.	"	18	361	" White Doyenne Pears.	" " "	"

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 15.	F.	31	362	Plate Beurre Hardy Pears.....	William Rowe.....	Walker.
" 15.	"	31	363	" " Doyenne Gray Pears.....	" " ".....	"
" 15.	H.	6	364	Five bunches Delaware Grapes.....	" " ".....	"
" 15.	"	18	365	" " Isabella Grapes.....	" " ".....	"
" 15.	S.	1	366	Collection of Verbenas.....	Mrs. Wm. Rowe.....	"
" 15.	"	9	367	" " Petunias.....	" " ".....	"
" 15.	"	15	368	" " German Stocks.....	" " ".....	"
" 15.	"	18	369	" " Zinnias.....	" " ".....	"
" 15.	"	19	370	" " Everlasting Flowers.....	" " ".....	"
" 15.	"	21	371	" " Coxcombs.....	" " ".....	"
" 15.	"	22	372	" " Phlox Drummondii.....	" " ".....	"
" 15.	"	24	373	" " Ornamental Grasses.....	" " ".....	"
" 15.	T.	2	374	Arrang't of Fr't & Fl's, table dec.	" " ".....	"
" 15.	"	8	375	Bouq't of Dried Grasses and Fl's	" " ".....	"
" 15.	M.	8	376	Red Raspberry Jam.....	P. Allyn.....	Traverse City.
" 15.	"	8	377	Black Cap Raspberry Jam.....	" " ".....	"
" 15.	"	9	378	Blackberry Jam.....	" " ".....	"
" 15.	"	15	379	Crab Apple Jam.....	" " ".....	"
" 15.	"	5	380	Blue Plum Jam.....	" " ".....	"
" 15.	H.	6	381	Five bunches Delaware Grapes.....	W. V. Pierce.....	Adrian.
" 15.	"	8	382	" " Concord Grapes.....	" " ".....	"
" 15.	"	18	383	" " Rogers' Grapes.....	" " ".....	"
" 15.	E.	1	384	Col. of Apples, grown by exhibit'r	E. P. Flanders.....	Galesburg.
" 15.	"	2	385	Single variety Summer Apples.....	" " ".....	"
" 15.	"	3	386	" " Autumn Apples.....	" " ".....	"
" 15.	"	4	387	" " Winter Apples.....	" " ".....	"
" 15.	"	9	388	" " Primate Apples.....	" " ".....	"
" 15.	"	10	389	" " Large Yellow Bough.....	" " ".....	"
" 15.	"	16	390	" " Lowell Apples.....	" " ".....	"
" 15.	"	19	391	" " Twenty-oz. Apples.....	" " ".....	"
" 15.	"	25	392	" " Fall Pippin Apples.....	" " ".....	"
" 15.	"	53	393	" " R. L. Green'g Apples.....	" " ".....	"
" 15.	"	58	394	" " Wagener Apples.....	" " ".....	"
" 15.	"	39	395	" " North'n Spy Apples.....	" " ".....	"
" 15.	"	43	396	" " Seek-no-Further.....	" " ".....	"
" 15.	"	45	397	" " K'g of Tompk's Co.....	" " ".....	"
" 15.	"	46	398	" " Yellow Bellflower.....	" " ".....	"
" 15.	"	47	399	Plate Talman Sweet Apples.....	" " ".....	"
" 15.	"	51	400	" " Swaar Apples.....	" " ".....	"
" 15.	"	52	401	" " Esopus Spitzenburg Apples.....	" " ".....	"
" 15.	"	53	402	" " Melon Apples.....	" " ".....	"
" 15.	"	40	403	" " Belmont Apples.....	" " ".....	"
" 15.	"	8	404	" " Maiden's Blush.....	" " ".....	"
" 15.	C.	1	405	T'nship Col. of Apples (Ganges t'p)	Lake Shore Pom. Society.....	Ganges.
" 15.	"	2	406	" " Peaches.....	" " ".....	"
" 15.	"	3	407	" " Pears.....	" " ".....	"
" 15.	N.	13	408	Currant Wine, 10 years old.....	Mrs. P. H. Higbee.....	Adrian.
" 15.	"	11	409	Red Raspberry Wine.....	" " ".....	"
" 15.	E.	21	410	Plate Hawley Apples.....	Roswell Sherman.....	Elk Rapids.
" 15.	"	8	411	" " Maiden's Blush Apples.....	" " ".....	"
" 15.	"	36	412	" " Golden Russet Apples.....	" " ".....	"
" 15.	"	54	413	" " Spice Sweet Apples.....	" " ".....	"
" 15.	"	47	414	" " Talman Sweet Apples.....	" " ".....	"
" 15.	"	29	415	" " Northern Spy Apples.....	" " ".....	"
" 15.	"	40	416	" " Belmont Apples.....	" " ".....	"
" 15.	"	5	417	" " Early Harvest Apples.....	" " ".....	"
" 15.	J.	8	418	Plate Canada Egg.....	Roswell Sherman.....	Elk Rapids.
" 15.	T.	5	419	P'r Bo'q'ts ar'ng'd in fm'l meth'd	Fred. Waltz.....	Detroit.
" 15.	"	5	420	" " ".....	" " ".....	"
" 15.	"	5	421	Small Hand Bouquet.....	" " ".....	"
" 15.	Q.	Spec'l	422	Ivy-leaved Geranium.....	Mrs. Alicia Forsyth.....	Saginaw City.
" 15.	Spec'l	423	Col. Winter Blooming Carnations.	" " ".....	" " ".....	"
" 15.	"	4	424	Spec'n Orn'al Ivy-leaved Geran'm	" " ".....	"
" 15.	"	1	425	Collection of Greenhouse Plants.....	" " ".....	"
" 15.	"	17	426	Specimen Plant of Calla.....	" " ".....	"
" 15.	M.	10	427	Whortleberry Jam.....	P. Allyn.....	Traverse City.
" 15.	B.	1	428	County Col. of Apples, Tuscola Co.	Wm. Johnson.....	Vassar.
" 15.	"	2	429	" " Peaches.....	" " ".....	"
" 15.	"	3	430	" " Pears.....	" " ".....	"
" 15.	"	4	431	" " Grapes.....	" " ".....	"
" 15.	K.	4	432	Dried Apples.....	Richard Elliot.....	Lansing.
" 15.	N.	18	433	Cider Vinegar.....	" " ".....	"
" 15.	B.	1	434	County Col. of Apples, Clint'n Co.	John Gilbert.....	Shepardsville.
" 15.	C.	1	435	Town'p Col. of Apples, (Ovid)	" " ".....	"
" 15.	E.	1	436	Col. of Apples grown by Exhibitor	" " ".....	"
" 15.	"	8	437	Plate Maiden's Blush.....	" " ".....	"
" 15.	"	9	438	" " Primate.....	" " ".....	"
" 15.	"	10	439	" " Large Yellow Bough.....	" " ".....	"
" 15.	"	16	440	" " Lowell (k'wn as Greasy P'n)	" " ".....	"

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 15.	E.	17	441	Plate Porter	John Gilbert	Shepardsville.
" 15.	"	18	442	" Keswick Codlin	" "	"
" 15.	"	19	443	" Twenty Ounce	" "	"
" 15.	"	21	444	" Hawley	" "	"
" 15.	"	23	445	" Jersey Sweet	" "	"
" 15.	"	25	446	" Fall Pippin	" "	"
" 15.	"	28	447	" Garden Royal	" "	"
" 15.	"	31	448	" Jonathan	" "	"
" 15.	"	32	449	" Peck's Pleasant	" "	"
" 15.	"	33	450	" R. I. Greening	" "	"
" 15.	"	34	451	" Baldwin	" "	"
" 15.	"	35	452	" Red Canada	" "	"
" 15.	"	2	453	Single variety Summer Apples	" "	"
" 15.	"	3	454	" " Autumn Apples	" "	"
" 15.	"	4	455	" " Winter Apples	" "	"
" 15.	"	36	456	Plate Golden Russet Apples	" "	"
" 15.	"	37	457	" Roxbury Russet Apples	" "	"
" 15.	"	38	458	" Wagener Apples	" "	"
" 15.	"	39	459	" Northern Spy Apples	" "	"
" 15.	"	40	460	" Belmont Apples	" "	"
" 15.	"	41	461	" Fameuse Apples	" "	"
" 15.	"	42	462	" Bailey Sweet Apples	" "	"
" 15.	"	43	463	" Westfield Seek-no-Further	" "	"
" 15.	"	45	464	" King of Tompkins County	" "	"
" 15.	"	46	465	" Yellow Bellflower Apples	" "	"
" 15.	"	47	466	" Talman Sweet Apples	" "	"
" 15.	"	52	467	" Esopus Spitzenburg	" "	"
" 15.	"	53	468	" Melon	" "	"
" 15.	F.	13	469	" Bartlett Pears	" "	"
" 15.	"	14	470	" Buffam Pears	" "	"
" 15.	"	15	471	" Flemish Beauty Pears	" "	"
" 15.	"	16	472	" Seckel Pears	" "	"
" 15.	"	17	473	" Onondago Pears	" "	"
" 15.	K.	3	474	Collection Dried Fruit, one family	" "	"
" 15.	"	4	475	Dried Apples by any process	" "	"
" 15.	L.	2	476	Collection Canned Fruit	" "	"
" 15.	"	4	477	Can of Pears	" "	"
" 15.	"	5	478	Can of Peaches	" "	"
" 15.	N.	Spec'l	479	Bottled Cider Wine	H. B. Chapman	Reading.
" 15.	L.	6	480	Canned Plums, 10 years old	" "	"
" 15.	"	30	481	Pickled Cucumbers, 10 years old	" "	"
" 15.	"	7	482	Can'd Mayduke Cher's 10 y's old	" "	"
" 15.	"	5	483	Can'd Sw't P'd Peaches, 2 y's old	" "	"
" 15.	"	33	484	Pickled Currant Catsup	" "	"
" 15.	E.	56	485	Single Variety Siberian Crab (Red)	" "	"
" 15.	"	56	486	" " " (Yellow)	" "	"
" 15.	D.	1	487	Col. of Fruit grown by Exhibitor	John C. Greening	Monroe.
" 15.	B.	1	488	Co. Col. of App's Calh'n Co., 71 y's	N. & C. Chilson	Battle Creek.
" 15.	E.	Spec'l	489	Holland Pippin and Pomme Grise to show difference in size	" "	"
" 15.	K.	23	490	Tomato Figs	E. P. Flanders	Galesburg.
" 15.	L.	29	491	Piccalilly, sour	D. L. Huff	Bay City.
" 15.	"	29	492	Sweet Pickled Tomatoes	" "	"
" 15.	T.	4	493	Floral Design	Mrs. William Rowe	Walker.
" 15.	"	7	494	Basket of Flowers for Table	" "	"
" 15.	Vicks	Spec'l	495	Cut Flowers from Seeds of Vick's	" "	"
" 15.	S.	1	496	Col'n and Display of Verbenas	John Ford & Son	Mich. Av. Det't.
" 15.	"	2	497	" " " Dahlias	" "	"
" 15.	"	10	498	" " " Asters	" "	"
" 15.	"	18	499	" " " Zinnias	" "	"
" 15.	"	22	500	" " " Phlox Drum'di	" "	"
" 15.	J.	1	501	Collection of Plums	G. W. Grant	Pentwater.
" 15.	H.	18	502	Rogers' No. 1 Grapes	John C. Greening	Monroe.
" 15.	"	8	503	Five Bunches Concord Grapes	" "	"
" 15.	"	18	504	Perkins' Grapes	" "	"
" 15.	"	14	505	Five Bunches Creveling Grapes	" "	"
" 15.	"	18	506	Rogers' No. 4 (Wilder)	" "	"
" 15.	"	6	507	Five Bunches Delaware Grapes	" "	"
" 15.	"	4	508	" " Hart'd Pro'c Grapes	" "	"
" 15.	"	18	509	Rogers' 15 Grapes	" "	"
" 15.	"	9	510	Five Bunches Iowa Grapes	" "	"
" 15.	"	18	511	" " Herbeumont Grapes	" "	"
" 15.	"	10	512	" " Ives' Seed'l'g Grapes	" "	"
" 15.	"	18	513	Norton's Virginia Seedling Grapes	" "	"
" 15.	"	18	514	Campau Grapes	" "	"
" 15.	"	20	515	Plate of Catawba Grapes	" "	"
" 15.	"	3	516	Five Bunches Martha Grapes	" "	"
" 15.	"	18	517	Salem Grapes	" "	"

STATE POMOLOGICAL SOCIETY.

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 15.	H.	1	518	Coll'n of Native Grapes grown by Exhibitor, 30 varieties.....	G. W. Bruckner.....	Monroe.
" 15.	"	3	519	Five Bunches Martha Grapes.....	" "	" "
" 15.	"	4	520	" Hart'd Pro'c Grapes.....	" "	" "
" 15.	"	6	521	" Delaware Grapes.....	" "	" "
" 15.	"	8	522	" Concord Grapes.....	" "	" "
" 15.	"	9	523	" Iona Grapes.....	" "	" "
" 15.	"	10	524	" Ives' Seed'g Grapes.....	" "	" "
" 15.	"	14	525	" Creveling Grapes.....	" "	" "
" 15.	"	19	526	Plate of Grapes for Wine.....	" "	" "
" 15.	"	20	527	" Catawba Grapes.....	" "	" "
" 15.	H.	20	528	" Catawba Grapes.....	Reynolds, Lewis & Co.....	" "
" 15.	"	18	529	" Rogers' Grapes.....	" " " "	" "
" 15.	"	6	530	" Delaware Grapes.....	" " " "	" "
" 15.	"	19	531	" Grapes for wine.....	" " " "	" "
" 15.	"	11	532	Five bunches Diana Grapes.....	" " " "	" "
" 15.	"	8	533	" Concord Grapes.....	" " " "	" "
" 15.	"	18	534	Clinton Grapes.....	" " " "	" "
" 15.	F.	18	535	Plate Bartlett Pears.....	G. W. Bruckner.....	" "
" 15.	R.	2	536	Specimen Plant, Fuchsia.....	Mrs. Alicia Forsyth.....	Saginaw City.
" 15.	Q.	11	537	" " Myrtles.....	" "	" "
" 15.	"	31	538	" " Acanthus.....	" "	" "
" 15.	"	31	540	" " Ivy-leaved Geranium.....	" "	" "
" 15.	"	31	541	Winter-blooming Herbtrotamus.....	" "	" "
" 15.	"	31	542	Mexicana.....	" "	" "
" 15.	"	31	543	Passion Flower.....	" "	" "
" 15.	"	17	544	Spotted Calla.....	" "	" "
" 15.	"	31	545	Periscus.....	" "	" "
" 15.	"	31	546	Camelia in bud.....	" "	" "
" 15.	"	31	547	Otaheite Orange, fruited.....	" "	" "
" 15.	"	10	548	Cactus, trailer.....	" "	" "
" 15.	"	31	549	Seedum.....	" "	" "
" 15.	P.	17	550	Specimen Gesenaria.....	" "	" "
" 15.	"	17	551	" Colens.....	" "	" "
" 15.	Q.	31	552	" Seedum.....	" "	" "
" 15.	R.	5	553	Rose Geranium.....	" "	" "
" 15.	"	11	554	Lemon Verbena.....	" "	" "
" 15.	Q.	20	555	Jasminum.....	" "	" "
" 15.	R.	22	556	Basket Plants.....	" "	" "
" 15.	B.	2	557	Co. Col. of Peaches (Ottawa Co.).....	Hunter Savidge.....	Spring Lake.
" 15.	H.	4	558	Plate Hartford Grapes.....	G. W. Brown.....	Lansing.
" 15.	"	18	559	Autouchon (Arnold's) Hybrid.....	" "	" "
" 15.	"	6	560	Five bunches Delaware Grapes.....	" "	" "
" 15.	"	18	561	" Merrimac Grapes.....	" "	" "
" 15.	"	18	562	Wildier.....	" "	" "
" 15.	"	5	563	Eumelan.....	" "	" "
" 15.	"	18	564	Perkins.....	" "	" "
" 15.	"	12	565	Agawan.....	" "	" "
" 15.	B.	3	566	Co. Col. of Pears (Calhoun Co.).....	N. & C. C. Chilson.....	Battle Creek.
" 15.	F.	4	567	Plate Winter Pears, Dix.....	Reynolds, Lewis & Co.....	Monroe.
" 15.	"	4	568	" Beurre d'Commice.....	" " " "	" "
" 15.	"	15	569	" Flemish Beauty.....	" " " "	" "
" 15.	"	16	570	" Seckel.....	" " " "	" "
" 15.	"	17	571	" Onondaga.....	" " " "	" "
" 15.	"	19	572	" Beurre d'Anjou.....	" " " "	" "
" 15.	"	29	573	" Beurre d'Claireau.....	" " " "	" "
" 15.	"	31	574	" Duchess d'Angouleme.....	" " " "	" "
" 15.	E.	16	575	" Lowell Apples.....	" " " "	" "
" 15.	"	25	576	" Fall Pippin.....	" " " "	" "
" 15.	"	31	577	" Jonathan.....	" " " "	" "
" 15.	"	33	578	" Rhode Island Greening.....	" " " "	" "
" 15.	"	35	579	" Red Canada.....	" " " "	" "
" 15.	"	38	580	" Wagener.....	" " " "	" "
" 15.	"	45	581	" King of Tompkins County.....	" " " "	" "
" 15.	"	46	582	" Yellow Bellflower.....	" " " "	" "
" 15.	B.	1	583	Co. Col. of Apples (Monroe Co.).....	" " " "	" "
" 15.	F.	3	584	" Pears (Monroe Co.).....	" " " "	" "
" 15.	H.	8	585	Concord Grapes.....	Hunter Savidge.....	Spring Lake.
" 15.	"	6	586	Delaware Grapes.....	" " " "	" "
" 15.	"	4	587	Hartford Prolific Grapes.....	" " " "	" "
" 15.	"	10	588	Ives' Seedling Grapes.....	" " " "	" "
" 15.	"	9	589	Iona Grapes.....	" " " "	" "
" 15.	"	14	590	Creveling Grapes.....	" " " "	" "
" 15.	"	18	591	Walter Grapes.....	" " " "	" "
" 15.	"	18	592	Rogers' No. 5.....	" " " "	" "
" 15.	"	18	593	Rogers' No. 33.....	" " " "	" "
" 15.	"	18	594	Telegraph Grapes.....	" " " "	" "
" 16.	J.	33	595	One-half peck Black Walnuts.....	Emmons Buell.....	Kalamazoo.

REGISTER OF ENTRIES.—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 16.	E.	45	596	Plate King of Tompkins County..	D. T. Fox.....	Kalamazoo.
" 16.	"	33	597	" Rhode Island Greening ..	" ".....	"
" 16.	"	32	598	" Peck's Pleasant ..	" ".....	"
" 16.	"	25	599	" Fall Pippin ..	" ".....	"
" 16.	"	40	600	" Belmont ..	" ".....	"
" 16.	"	10	601	" Yellow Bough ..	" ".....	"
" 16.	"	9	602	" Primate ..	" ".....	"
" 16.	"	31	603	" Jonathan ..	" ".....	"
" 16.	D.	1	604	Col. of Fruits, grown by exhibitor	N. & C. Chilson.....	Battle Creek.
" 16.	K.	2	605	Collection of Dried Fruit, product of one factory, Aiden ..	M. Graves, Sec'y Farmers' Fruit Preserving Co.....	Adrian.
" 16.	G.	8	606	Plate Crawford's Early Peaches ..	Asa M. Pringle.....	Mears Station.
" 16.	F.	15	607	" Flemish Beauty Pears ..	" ".....	"
" 16.	R.	19	608	Chinese Honeysuckle ..	Mrs. Alicia Forsyth.....	Saginaw City.
" 16.	L.	6	609	Can of Canned Plums (dark) ..	Mr. D. F. Rose.....	East Saginaw.
" 16.	Spe cial.	610	610	Four Cages of Birds ..	E. F. Guild ..	"
" 16.	Q.	15	611	Flowering Bignonia ..	Fred. H. Herbert.....	"
" 16.	H.	9	612	Plate Iona Grapes ..	Wm. Fulkerson.....	Ovid.
" 16.	"	18	613	" Wilder Grapes ..	" ".....	"
" 16.	"	18	614	" Merrimac Grapes ..	" ".....	"
" 16.	"	3	615	" Martha Grapes ..	" ".....	"
" 16.	"	8	616	" Concord Grapes ..	" ".....	"
" 16.	R.	5	617	Collection Scented Geraniums ..	Mrs. Alicia Forsyth.....	Saginaw City.
" 16.	E.	2	618	Plate single var'ty Summer Apples	Joseph Gridley.....	Kalamo.
" 16.	"	3	619	" Autumn Apples ..	" ".....	"
" 16.	"	4	620	" Winter Apples ..	" ".....	"
" 16.	H.	6	621	Delaware Grapes ..	A. S. Dyckman.....	South Haven.
" 16.	F.	17	622	Onondaga Pears ..	" ".....	"
" 16.	"	31	623	Louise Bonne Pears ..	" ".....	"
" 16.	"	31	624	Unknown variety Pears ..	" ".....	"
" 16.	G.	9	625	Plate Barnard Peaches ..	" ".....	"
" 16.	"	11	626	Jacques Rareripe ..	" ".....	"
" 16.	"	16	627	Stump the World ..	" ".....	"
" 16.	"	16	628	Stump the World ..	" ".....	"
" 16.	J.	1	629	Collection Plums for exhibition ..	E. J. Shirtz ..	Shelby.
" 16.	R.	13	630	Specimen of Nerium (Oleander) ..	Mrs. W. H. Frost ..	South Saginaw.
" 16.	E.	39	631	Plate Northern Spy ..	N. & C. Chilson.....	Battle Creek.
" 16.	"	38	632	" Wagoner ..	" ".....	"
" 16.	"	54	633	" Fall Geneting ..	" ".....	"
" 16.	"	9	634	" Primate ..	" ".....	"
" 16.	"	20	635	" Chenango Strawberry ..	" ".....	"
" 16.	"	51	636	" Swaar ..	" ".....	"
" 16.	"	54	637	" Steele's Red ..	" ".....	"
" 16.	"	23	638	" Jersey Sweet ..	" ".....	"
" 16.	"	48	639	" Lady's Sweet ..	" ".....	"
" 16.	"	54	640	" Vandevere ..	" ".....	"
" 16.	"	54	641	" Hartford Sweet ..	" ".....	"
" 16.	"	54	642	" Munson Sweet ..	" ".....	"
" 16.	"	36	643	" Golden Russet ..	" ".....	"
" 16.	"	54	644	" Willow Twig ..	" ".....	"
" 16.	"	29	645	" Summer Pearmain ..	" ".....	"
" 16.	"	41	646	" Fameuse ..	" ".....	"
" 16.	"	58	647	" Melon ..	" ".....	"
" 16.	"	31	648	" Jonathan ..	" ".....	"
" 16.	"	46	649	" Yellow Bellflower ..	" ".....	"
" 16.	"	34	650	" Baldwin ..	" ".....	"
" 16.	"	54	651	" Twenty-ounce Pippin ..	" ".....	"
" 16.	"	32	652	" Peck's Pleasant ..	" ".....	"
" 16.	"	25	653	" Fall Pippin ..	" ".....	"
" 16.	"	54	654	" Fallawater ..	" ".....	"
" 16.	"	54	655	" Kingsley ..	" ".....	"
" 16.	"	54	656	" Red-cheek Pippin ..	" ".....	"
" 16.	"	45	657	" King of Tompkins County ..	" ".....	"
" 16.	"	43	658	" Seek-no-further ..	" ".....	"
" 16.	"	54	659	" Dominic ..	" ".....	"
" 16.	"	54	660	" Colvert ..	" ".....	"
" 16.	"	17	661	" Porter Apples ..	" ".....	"
" 16.	"	47	662	" Talman Sweet ..	" ".....	"
" 16.	"	54	663	" Pomme Grise ..	" ".....	"
" 16.	"	54	664	" Rambo ..	" ".....	"
" 16.	"	38	665	" Rhode Island Greening ..	" ".....	"
" 16.	"	52	666	" Esopus Spitzenburg ..	" ".....	"
" 16.	G.	27	667	" Reve's Favorite Peach ..	" ".....	"
" 16.	F.	31	668	" Howell Pears ..	" ".....	"
" 16.	"	21	669	" Sheldon Pears ..	" ".....	"
" 16.	"	17	670	" Onondaga Pears ..	" ".....	"
" 16.	"	31	671	" Dix Pears ..	" ".....	"
" 16.	"	31	672	" Bonne de Jersey ..	" ".....	"

REGISTER OF ENTRIES—CONTINUED.

DATE OF ENTRY.	Div.	Class.	No.	ARTICLE.	BY WHOM ENTERED.	P. O. ADDRESS AND REMARKS.
Sept. 16.	F.	14	673	Plate Buffam Pears	N. & C. Chilson	Battle Creek.
" 16.	L.	33	674	Tomato Catsup, seedless	D. L. Huff	Bay City.
" 16.	"	33	675	" " with seeds	" "	" "
" 16.	"	6	676	One Can Canned Blue Plums	" "	" "
" 16.	E.	54	677	Autumn Strawberry Apple	N. & C. Chilson	Battle Creek.
" 16.	"	40	678	Belmont	" "	" "
" 16.	"	30	679	Autumn Swaar	" "	" "
" 16.	"	54	680	Twenty-ounce Apple	" "	" "
" 16.	"	54	681	New York Vandevere	" "	" "

Total number of entries in orchard and vineyard department..... 55

Total number of entries in fruit and flower department..... 681

Total entries in Pomological Society..... 736

LIST OF PREMIUMS AWARDED BY THE POMOLOGICAL SOCIETY AT THE
STATE FAIR HELD AT EAST SAGINAW SEPTEM-
BER 14-19, 1874.

DIVISION B.—COUNTY COLLECTIONS.

Class 1. County Collection of Apples—First premium, John Gilbert, Shepardsville, Clinton county, \$50; second premium, Reynolds, Lewis & Co., Monroe, Monroe county, \$30; third premium, William Johnson, Vassar, Tuscola county, \$20.

Class 2. County Collection of Peaches—Second premium, Hunter Savidge, Spring Lake, Ottawa county, \$20.

Class 3. County Collection of Pears—First premium, Reynolds, Lewis & Co., Monroe, Monroe county, \$30; second premium, N. and C. Chilson, Battle Creek, Calhoun county, \$20.

Class 4. County Collection of Grapes—First premium, Pointe aux Peaux Grape and Wine Co., Monroe, Monroe county, \$25; second premium, George P. Butler, East Saginaw, Saginaw county, \$15; third premium, William Johnson, Vassar, Tuscola county, \$10.

Committee—E. Buell, Kalamazoo; Prof. W. J. Beal, Lansing; D. T. Fox, Kalamazoo.

DIVISION C.—TOWNSHIP COLLECTIONS.

Class 1. Township Collection of Apples—First premium, George Parmelee, Peninsular township, Grand Traverse county, \$25; second premium, William Rowe, Walker, Kent county, \$15; third premium, John Gilbert, Ovid, Clinton county, \$10.

Class 2. Township Collection of Peaches—First premium, Lake Shore Pomological Society, Ganges township, Allegan county, \$15.

Class 4. Township Collection of Grapes—First premium, Pointe aux Peaux Grape and Wine Co., Monroe, Monroe county, \$12.

Committee—E. Buell, Kalamazoo; Prof. W. J. Beal, Lansing; D. T. Fox, Kalamazoo.

DIVISION D.—INDIVIDUAL COLLECTIONS.

Class 1. Collection of Fruit grown by Exhibitor—First premium, N. & C. Chilson, Battle Creek, \$20; second premium, David Geddes, Saginaw City, \$15; third premium, J. C. Greening, Monroe, \$10.

Committee—E. Buell, Kalamazoo; Prof. W. J. Beal, Lansing; D. T. Fox, Kalamazoo.

DIVISION E.—APPLES.

Class 1. Collection of Apples grown by Exhibitor—First premium, E. P. Flanders, Galesburg, Kalamazoo county, \$15; second premium, I. E. Ilgenfritz & Co., Monroe, \$10; third premium, John Gilbert, Shepardsville, Clinton county, \$5.

Class 2. Plate single variety Summer Apples—First premium, Primate, E. P. Flanders, Galesburg, \$2; second premium, Benoni, I. E. Ilgenfritz & Co., \$1; third premium, Chenango Strawberry, Joseph Gridley, Kalamazoo, 50c.

Class 3. Plate single variety Autumn Apples—First premium, Maiden's Blush, John Gilbert, Shepardsville, \$2; second premium, Keswick Codlin, I. E. Ilgenfritz & Co., \$1.

Class 4. Single variety Winter Apples—First premium, Northern Spy, E. P. Flanders, \$2.

Class 8. Maiden's Blush—First premium, Roswell Sherman, Elk Rapids, \$1; second premium, John Gilbert, Shepardsville, 50c.

Class 9. Primate—First premium, E. P. Flanders, \$1; second premium, John Gilbert, 50c.

Class 10. Large Yellow Bough—First premium, John Gilbert, \$1; second premium, E. P. Flanders, 50c.

Class 13. Early Strawberry—First premium, I. E. Ilgenfritz, \$1.

Class 16. Lowell—First premium, John Gilbert, \$1; second premium, E. P. Flanders, 50c.

Class 17. Plate Porter—First premium, N. & C. Chilson, Battle Creek, \$1; second premium, John Gilbert, 50c.

Class 18. Keswick Codlin—First premium, John Gilbert, Battle Creek, \$1; second premium, William Rowe, Walker, Kent county, 50c.

Class 19. Twenty Ounce—First premium, N. & C. Chilson, Battle Creek, \$1; second premium, John Gilbert, 50c.

Class 20. Chenango Strawberry—First premium, N. & C. Chilson, Battle Creek, \$1.

Class 21. Hawley—First premium, Thos. Wilde, Berlin, Ottawa county, \$1.

Class 23. Jersey Sweet—First premium, N. & C. Chilson, Battle Creek, \$1; second premium, John Gilbert, 50c.

Class 25. Fall Pippin—First premium, N. & C. Chilson, Battle Creek, \$1; second premium, E. P. Flanders, 50c.

Class 29. Summer Pearmain—First premium, N. & C. Chilson, Battle Creek, \$1.

Class 30. Autumn Swaar—First premium, N. & C. Chilson, Battle Creek, \$1.

Class 31. Plate Jonathan—First premium, N. & C. Chilson, Battle Creek, \$1; second premium, I. E. Ilgenfritz, 50c.

Class 33. Rhode Island Greening—First premium, E. P. Flanders, \$1; second premium, D. T. Fox, Kalamazoo, 50c.

Class 34. Plate Baldwin—First premium, N. & C. Chilson, Battle Creek, \$1; second premium, John Gilbert, 50c.

Class 35. Red Canada—First premium, N. & C. Chilson, \$1; second premium, John Gilbert, 50c.

Class 36. Golden Russet—First premium, Wm. Rowe, Walker, Kent county, \$1; second premium, I. E. Ilgenfritz, 50c.

Class 37. Roxbury Russet—First premium, John Gilbert, \$1; second premium, I. E. Ilgenfritz, 50c.

Class 38. Plate Wagener—First premium, N. & C. Chilson, \$1; second premium, E. P. Flanders, 50c.

Class 39. Northern Spy—First premium, N. & C. Chilson, \$1; second premium, John Gilbert, 50c.

Class 40. Plate Belmont—First premium, Roswell Sherman, Elk Rapids, \$1; second premium, D. T. Fox, Kalamazoo, 50c.

Class 41. Plate Fameuse—First premium, N. & C. Chilson, \$1; second premium, Wm. Rowe, Walker, Kent county, 50c.

Class 43. Westfield Seek-no Further—First premium, Wm. Rowe, Walker, \$1; second premium, N. & C. Chilson, 50c.

Class 44. Hubbardston Nonsuch—First premium, Wm. Rowe, Walker, Kent county, \$1; second premium, E. P. Flanders, 50c.

Class 45. King of Tompkins County—First premium, E. P. Flanders, \$1; second premium, N. & C. Chilson, 50c.

Class 46. Yellow Bellflower—First premium, I. E. Ilgenfritz, \$1; second premium, E. P. Flanders, 50c.

Class 47. Talman Sweet—First premium, N. & C. Chilson, \$1; second premium, Roswell Sherman, 50c.

Class 48. Ladies' Sweet—First premium, N. & C. Chilson, \$1.

Class 50. Grimes' Golden—First premium, I. E. Ilgenfritz, \$1.

Class 51. Plate Swaar—First premium, N. & C. Chilson, \$1; second premium, E. P. Flanders, 50c.

Class 52. Esopus Spitzenburg—First premium, N. & C. Chilson, \$1; second premium, I. E. Ilgenfritz, 50c.

Class 53. Plate Melon—First premium, E. P. Flanders, \$1; second premium, N. & C. Chilson, 50c.

Class 54. Red Cheek Pippin—First premium, N. & C. Chilson, \$1; Mammoth Pippin, second premium, N. & C. Chilson, 50c.

Class 54. Spice Sweet—Roswell Sherman, Elk Rapids, discretionary premium of \$1 for an exceedingly fine plate of apples, perhaps, for beauty, the finest on exhibition. But your committee would not recommend its cultivation except in extensive collections of amateur varieties.

Class 55. Collection Siberian Crab Apples—First premium, Mrs. James Bolton, East Saginaw, \$1.

Class 56. Single variety Siberian Crab Apple—First premium, H. P. Chapman, Reading, \$1; second premium, Wm. Rowe, Walker, Kent county, 50c.

Class 57. Transcendent Crab—First premium, Wm. Rowe, Walker, \$1.

Class 59. Montreal Beauty—First premium, Wm. Rowe, Walker, \$1.

Class special. Holland Pippin and Pomme Grise—First premium, E. P. Flanders, \$1.

Your committee would say, in making their report, that they found the department well filled throughout with remarkably fine specimens. In fact, we would say that, having attended the exhibitions of the State Pomological Society since its organization, and also the former exhibitions of the State Agricultural Society in this department, that at no former exhibition has there been exhibited so fine a collection as we found in this department.

Taking the extreme drouth of the season into consideration, it is remarkable that such productions of fruit could be found as the products of this State, and this speaks volumes for the fact that Michigan stands to-day as a leading State in the production of fruits.

Your committee would call the attention of your board of officers to the specimens of Harris' Seedling exhibited by H. R. Downey, of Grand Blanc, as a fall variety. This bids fair to be placed among our finest varieties of recent origin.

Committee—J. A. Robinson, Battle Creek; G. H. Le Fleur, Coldwater; H. Dale Adams, Galesburg.

DIVISION F.—PEARS.

Class 1. Collection of Pears Grown by Exhibitor—First premium, I. E. Ilgenfritz, Monroe, Monroe county, 34 varieties, \$15.

Class 2. Plate Summer Pears—First premium, one variety, I. E. Ilgenfritz, Monroe, \$2.

Class 3. Plate Autumn Pears—First premium, I. E. Ilgenfritz, Monroe, \$2; second premium, H. B. Chapman, Reading, Hillsdale county, \$1.

Class 4. Plate Winter Pears—First premium, I. E. Ilgenfritz, Monroe, \$2.

Class 10. Bartlett Pears—First premium, John Gilbert, Shepardsville, Clinton county, \$1; second premium, I. E. Ilgenfritz, Monroe, 50c.

Class 14. Plate Buffam—First premium, I. E. Ilgenfritz, Monroe, \$1; second premium, N. & C. Chilson, Battle Creek, 50c.

Class 15. Flemish Beauty—First premium, H. B. Chapman, Reading, Hillsdale county, \$1; second premium, John Gilbert, Shepardsville, 50c.

Class 16. Plate Seckel—First premium, William Rowe, Walker, Kent county, \$1; second premium, Reynolds, Lewis & Co., Monroe, 50c.

Class 17. Onondaga Pears—First premium, H. B. Chapman, Reading, \$1; second premium, John Gilbert, Shepardsville, 50c.

Class 18. White Doyenne—First premium, I. E. Ilgenfritz, Monroe, \$1; second premium, William Rowe, Walker, Kent county, 50c.

Class 19. Beurre d'Anjou—First premium, I. E. Ilgenfritz, Monroe, \$1; second premium, Reynolds, Lewis & Co., Monroe, 50c.

Class 21. Sheldon Pears—First premium, I. E. Ilgenfritz & Co., Monroe, \$1; second premium, H. B. Chapman, Reading, 50c.

Class 23. Fondante d'Automne—First premium, I. E. Ilgenfritz, Monroe, \$1.

Class 26. Plate Lawrence—First premium, I. E. Ilgenfritz, Monroe, \$1.

Class 27. Plate Beurre Diel—First premium, I. E. Ilgenfritz, Monroe, \$1.

Class 28. Plate Winter Nelis—First premium, I. E. Ilgenfritz, Monroe, \$1.

Class 29. Beurre Clairgeau—First premium, Reynolds, Lewis & Co., Monroe, \$1; second premium, I. E. Ilgenfritz, 50c.

Class 30. Doyenne Boussock—First premium, I. E. Ilgenfritz, Monroe, \$1.

Class 31. Louise Bonne de Jersey—First premium, Thomas Wilde, Berlin, Ottawa, \$1.

Class 31. Glout Morceau—First premium, H. B. Chapman, Reading, \$1.

Class 31. Louise Bonne Pear—Second premium, H. B. Chapman, Reading, 50c.

Class 31. Fulton Pear—First premium, H. B. Chapman, Reading, \$1.

Class 31. Stephens Genesee Pear—First premium, H. B. Chapman, Reading, \$1.

Class 31. Lodge Pear—First premium, H. B. Chapman, Reading, \$1.

Class 31. Delices d'Hardenpont Pear—Second premium, H. B. Chapman, Reading, 50c.

Class 31. Beurre Hardy Pear—First premium William Rowe, Walker, Kent county, \$1.

Class 31. Doyenne Gray—First premium, William Rowe, Walker, Kent county, \$1.

Class 31. Duchesse d'Angouleme—First premium, Reynolds, Lewis & Co., Monroe, \$1.

Class 31. Dix Pear—Second Premium, Reynolds, Lewis & Co., Monroe, 50c.

Class 31. Doyenne de Comice—First premium, Reynolds, Lewis & Co., \$1.

Committee—J. W. Humphrey, Plymouth; Thos. Wilde, Berlin, Ottawa Co.

DIVISION G.—PEACHES.

Class 8. Plate Crawford's Early—First premium, Asa M. Pringle, Mears station, Oceana county, \$1; second premium, H. B. Chapman, Reading, Hillsdale county, 50c.

Class 12. Plate Crawford's Late—Second premium, H. B. Chapman, Reading, Hillsdale county, 50c.

Class 27. Tuff's Rareripe—First premium, H. B. Chapman, Reading, Hillsdale county, \$1.

Class 27. Reeves' Favorite—First premium, N. & C. Chilson, Battle Creek, Calhoun county, \$1.

Committee—D. T. Fox, Kalamazoo; Thos. Wilde, Berlin, Ottawa county.

DIVISION H.—GRAPES.

Class 1. Collection of Native Grapes grown by Exhibitor—First premium, Pointe aux Peaux Grape & Wine Co., Monroe, \$15; second premium, G. W. Bruckner, Monroe, \$10.

Class 3. Five bunches Martha—First premium, John C. Greening, Monroe, \$1.

Class 4. Hartford Prolific—First premium, George W. Bruckner, Monroe, \$1; second premium, John C. Greening, Monroe, 50c.

Class 5. Five bunches Eumelan—First premium, G. W. Brown, Lansing, \$1;

Class 6. Delaware—First premium, William Rowe, Walker, Kent county, \$1; second premium, Hunter Savidge, Spring Lake, Ottawa county, 50c.

Class 8. Concord Grapes—First premium, W. V. Pierce, Adrian, \$1; second premium, William Fulkerson, Ovid, Clinton county, 50c.

Class 9. Iona Grapes—First premium, Hunter Savidge, Spring Lake, \$1; second premium, John C. Zeigler, Saginaw city, 50c.

Class 10. Ives' Seedling—First premium, John C. Greening, Monroe, \$1; second premium, Hunter Savidge, Spring Lake, 50c.

Class 12. Five Bunches Agawam—First premium, John C. Greening, Monroe, \$1; second premium, G. W. Brown, Lansing, 50c.

Class 14. Creveling Grapes—First premium, George W. Bruckner, Monroe, \$1; second premium, Hunter Savidge, Spring Lake, 50c.

Class 18. German Wine Grape—First premium, Ernest Herpel, Taymouth, Saginaw county, \$1.

Class 18. Rogers' No. 4—First premium, W. V. Pierce, Adrian, \$1.

Class 18. Plate Autuchon, or Arnold's No. 5—First premium, G. W. Brown, Lansing, \$1.

Class 18. Rogers' No. 33—First premium, Hunter Savidge, Spring Lake, \$1.

Class 19—Plate of Grapes for Wine—George W. Bruckner, Monroe, enters Norton's Virginia; Reynolds, Lewis & Co., Monroe, Iona.

NOTE—Mr. Bradfield would say the Iona, others would say some other variety. The fact is, one grape may be best one season and in one locality, and *vice versa*.

Class 20. Plate of Catawba—First premium, G. W. Bruckner, Monroe, \$1; second premium, John C. Greening, Monroe, 50c.

Committee—E. Bradfield, Ada, Kent county; Phineas Allyn, Traverse City; L. P. Mason, East Saginaw.

DIVISION J.—PLUMS.

Class 1. Collection of Plums not less than Six Varieties—First premium, E. J. Shirtz, Shelby, Oceana county, \$10; second premium, G. W. Grant, Pentwater, Oceana county, \$5.

Class 4. Plate Duane's Purple—First premium, L. P. Mason, East Saginaw, \$1.

Class 8. Plate Canada Egg—First premium, Roswell Sherman, Elk Rapids, Antrim county, \$1.

Class 17. Plate of Plums—First premium, M. C. Mower, East Saginaw, \$1.

Class 17. Lawrence's Favorite Plum—Second premium, L. P. Mason, East Saginaw, 50c.

Class 33. Half-peck Black Walnuts—First premium, Emmons Buell, Kalamazoo, \$1.

Committee—William H. Gregory, Kendall, Van Buren county; J. G. Ramsdell, Traverse City.

DIVISION K.—DRIED FRUIT.

Collection of Dried Fruit, product of one Alden factory—First premium, Wm. Graves, Secretary of Farmers' Fruit Preserving Company of Palmyra, Adrian.

There was a fine collection of dried fruits and vegetables exhibited by Packard & Co. of Sturgis, but not entered for a premium. This collection attracted a good deal of notice, and was prepared by the Packard Improved Fruit Drier of Sturgis, Mich.

Class 3. Collection of domestic dried fruit, product of one family or individual—First premium, L. C. Lincoln, Greenville, Montcalm county, \$5; second, John Gilbert, Shepardsville, Clinton county, \$3.

Class 4. Dried Apples by any process—First premium, John Gilbert, Shepardsville, Clinton county, \$1.

Class 14. Dried Currants by any process—First premium, Mrs. James Bolton, East Saginaw, \$1.

Class 23. Dried Tomato Figs—First premium, Mrs. D. L. Huff, Bay City, Bay county, \$1.

Committee—J. D. W. Fisk, Coldwater; C. H. Burr, Coldwater.

DIVISION L.—CANNED FRUITS.

Class 2. Collection domestic canned and pickled fruit—First premium, John Gilbert, Shepardsville, Clinton county, \$5.

Class 4. Canned Pears—First premium, John Gilbert, Shepardsville, Clinton county, \$1.

Class 5. Canned Peaches—First premium, Mrs. D. F. Rose, East Saginaw, \$1.

Class 6. Canned Plums—First premium, H. B. Chapman, Reading, Hillsdale county, \$1.

Class 7. Canned Cherries—First premium, H. B. Chapman, Reading, Hillsdale county, \$1.

Class 8. Canned Siberian Apples—First premium, L. C. Lincoln, Greenville, Montcalm county, \$1.

Class 10. Canned Raspberries—First premium, Mrs. James Bolton, East Saginaw, \$1.

Class 11. Canned Raspberries—First premium, L. C. Lincoln, Greenville, Montcalm county, \$1.

Class 13. Canned Quinces—First premium, Mrs. J. B. White, Saginaw City, \$1.

Class 15. Canned Currants—First premium, L. C. Lincoln, Greenville, Montcalm county, \$1.

Class 18. Canned Tomatoes—First premium, L. C. Lincoln, Greenville, Montcalm county, \$1.

Class 23. Pickled Peaches—First premium, H. B. Chapman, Reading, Hillsdale county, \$1.

Class 29. Piccadilli—First premium, Mrs. D. L. Huff, Bay City, \$1.

Class 29. Pickled Tomatoes—First premium, L. C. Lincoln, Greenville, Montcalm county, \$1.

Class 30. Pickled Cucumbers—First premium, H. B. Chapman, Reading, Hillsdale county, \$1.

Class 33. Pickled Catsup—First premium, H. B. Chapman, Reading, Hillsdale county, \$1.

Committee—J. D. W. Fisk, Coldwater; C. H. Burr, Coldwater; Mrs. C. H. Burr, Coldwater.

DIVISION M.—PRESERVED FRUIT.

Class 1. Collection of Preserved Fruits and Jellies put up by Exhibitor—First premium, P. Allyn, Traverse City, \$5.

Class 4. Preserved Peaches—First premium, Mrs. D. F. Rose, E. Saginaw, \$1.

Class 5. Preserved Plums—First premium, P. Allyn, Traverse City, \$1.

Class 8. Preserved Raspberries—First premium, P. Allyn, Traverse City, \$1.

Class 9. Preserved Blackberries—First premium, P. Allyn, Traverse City, \$1.

Class 10. Preserved Whortleberries—First premium, P. Allyn, Traverse City, \$1.

Class 12. Preserved Currants—First premium, Mrs. J. B. White, Saginaw City, \$1.

Class 15. Preserved Crab Apples—First prem., L. C. Lincoln, Greenville, \$1.

Class 16. Preserved Tomatoes—First premium, L. C. Lincoln, Greenville, \$1.

Class 18. Collection of Jellies—First premium, Mrs. Jas. Bolton, East Saginaw, \$1.

Class 21. Siberian Crab Jelly—First premium, L. C. Lincoln, Greenville, \$1.

Committee—J. D. W. Fisk, Coldwater; C. H. Burr, Coldwater.

DIVISION N.—WINES.

Class 4. Clinton Wine—First premium, John C. Ziegler, Saginaw City, \$2.

Class 11. Native Wine—First premium, John Shepherd, Saginaw City, \$2; first premium, P. Allyn, Traverse City, \$2; first premium, Mrs. P. H. Higby, Adrian, \$2; second premium, John C. Ziegler, Saginaw City, \$1.

Class 12. Wild Grape Wine—First premium, Mrs. E. Dunston, Clarkston, Oakland county, \$2.

Class 13. Currant Wine—First premium, Mrs. J. B. White, Saginaw City, \$2; first premium, John C. Ziegler, \$2; second premium, John Shepherd, \$1.

Class 14. Blackberry Wine—First premium, P. Allyn, Traverse City, \$2; second premium, Mrs. James Bolton, East Saginaw, \$1.

Class 15. Elderberry Wine—First premium, Mrs. J. B. White, Saginaw City, \$2.

Class 16. Bottled Cider—First premium, Mrs. J. B. White, \$2; first premium, H. B. Chapman, Reading, \$2.

Class 17. Boiled Cider—First premium, Mrs. J. B. White, \$2; second premium, Mrs. Dunstan, Clarkston, Oakland county, \$1.

Class 18. Cider Vinegar—First premium, Mrs. A. W. Wright, Saginaw City, \$2; first premium, Mrs. E. Dunstan, Clarkston, \$2; second premium, Richard Elliott, Lansing, \$1.

CLASS SPECIAL.

Raspberry Syrup or Vinegar—First premium, H. B. Chapman, \$2.

Blackberry Vinegar—First premium, P. Allyn, Traverse City, \$2.

Black Raspberry Shrub—First premium, P. Allyn, \$2.

Black Raspberry Vinegar—Second premium, P. Allyn, \$1.

Bottled Cider Wine—Second premium, H. B. Chapman, \$1.

The committee report that the specimens of wine shown this year were fair, but with the exception of the wines from the Clinton and Concord grapes shown by Mr. Ziegler, all partook more of the character of sweet cordials than of wines.

Committee—R. F. Johnstone, J. G. Ramsdell, Mrs. H. E. Deparmo.

DIVISION P.—FLOWERS.

Class 2. Collection of Caladiums—First premium, I. Dyckmann, \$4.

Class 4. Collection of Foliage Begonias—First premium, I. Dyckmann, \$4; second premium, Fred. H. Herbert, \$2.

Class 5. Collection of Hot-House Plants, Coleus—Second premium, Fred. H. Herbert, \$2; Geraniums—First premium, Mrs. A. Forsyth, \$3.

Class 11. Specimen Plant Cissus—First premium, Mrs. A. Forsyth, \$1.

Class 17. Night-Blooming Jasmirium—First premium, Mrs. A. Forsyth, \$1.

Class 17. Geseneria—First premium, Mrs. A. Forsyth, \$1; Gesenaria—Second premium, Mrs. A. S. Parke, 50c.

Committee—Mrs. W. L. Webber, East Saginaw; Mrs. D. F. Rose, East Saginaw; Mrs. H. E. White, Saginaw City.

DIVISION Q.—GREENHOUSE PLANTS.

Class 1. Collection and Display of Greenhouse Plants shown by one Exhibitor—First premium, I. Dyckmann, East Saginaw, \$20; second premium, Mrs. Amos S. Parke, East Saginaw, \$10; third premium, Mrs. A. Forsyth, Saginaw City, \$5.

Class 2. Collection of Fuchsias—First premium, I. Dyckmann, East Saginaw, \$3; second premium, Fred. H. Herbert, East Saginaw, \$2.

Class 3. Collection of Roses (19 choice varieties)—First premium, Mrs. Amos S. Parke, \$3.

Class 4. Collection Ornamental Leaved Geraniums (30 varieties)—First premium, I. Dyckmann, East Saginaw, \$3.

Class 6. Collection of Colored Foliage Plants (60 varieties)—First premium, I. Dyckmann, East Saginaw, \$3.

Class 7. Collection of Agaves, Aloes, etc., (6 varieties)—First premium, Mrs. Amos S. Parke, East Saginaw, \$3.

Class 8. Collection of Cacti (17 varieties)—First premium, Mrs. Amos S. Parke, \$3; second premium, Mrs. Alicia Forsyth, \$2.

Class 9. Collection of Tuberose—First premium, Fred. H. Herbert, East Saginaw, \$2.

Class 9. Zonale Geranium (40 varieties)—First premium, Mrs. Amos S. Parke, East Saginaw, \$2.

Class 9. Abutilon (6 varieties)—First premium, Mrs. Alice Forsyth, \$2.

Class 10. Specimen Plant Cactus—First premium, Mrs. A. Forsyth, \$1; first premium, Mrs. A. Forsyth, \$1.

Class 11. Specimen plant of Myrtus—First premium, Mrs. A. Forsyth, Saginaw City, \$1; first premium, Mrs. A. Forsyth, Saginaw City, \$1.

Class 13. Specimen Plant Abutilon—Second premium, Mrs. A. Forsyth, Saginaw City, 50c.

Class 15. Specimen Plant Bignonia—First premium, Mrs. A. S. Parke, East Saginaw, \$1.

Class 17. Specimen Plant Calla—First premium, Fred. H. Herbert, East Saginaw, \$1.

Class 20. Specimen Plant Jasminum—First premium, Mrs. A. Forsyth, Saginaw City, \$1.

Class 23. Specimen Plant Stevia—First premium, Mrs. A. S. Parke, East Saginaw, \$1.

Class 24. Specimen Plant Tuberose—First premium, I. Dyckmann, East Saginaw, \$1.

Class 30. Specimen Plant Lycopodium—First premium, Mrs. Alicia Forsyth, Saginaw City, \$3.

Class 31. Night-Blooming Cereus—First premium, Mrs. A. Forsyth, Saginaw City, \$1.

Class 31. Farfugium—First premium, Mrs. A. Forsyth, Saginaw City, \$1.

Class 31. Seedum—First premium, Mrs. A. Forsyth, Saginaw City, \$1.

Class 31. Achavoria (a beautiful plant)—First premium, Mrs. A. S. Parke, East Saginaw, \$1.

Class 31. Eupatorium—First premium, Mrs. A. S. Parke, East Saginaw, \$1.

Class 31. Ficus Alistaca—First premium, Mrs. A. S. Parke, East Saginaw, \$1.

Class 31. Bearing Lemon Tree—First premium, Mrs. A. S. Parke, East Saginaw, \$1.

Class 31. Euphorbia Splendidus—First premium, Mrs. A. S. Parke, East Saginaw, \$1.

Special. Globe Fern—First premium, Mrs. A. Forsyth, Saginaw, \$1.

Special. Winter-Blooming Carnation—First premium, Mrs. A. Forsyth, \$1.

Committee—William Rowe, Mrs. William Rowe, Walker, Kent county; Thomas Wilde, Berlin, Ottawa county.

DIVISION R.—HOUSE PLANTS.

Class 1. Collection of House Plants—First premium, Mrs. Alicia Forsyth, Saginaw City, \$15; second premium, Mrs. Charles F. Webber, East Saginaw, \$10.

Class 2. Specimen Plant of Fuchsia—First premium, Mrs. Alicia Forsyth, \$1.

Class 5. Specimen Plant of Scented-leaved Geranium—Second premium, Mrs. Alicia Forsyth, Saginaw City, 50c.; Scented Rose Geranium—Second premium, Mrs. Alicia Forsyth, Saginaw City, 50c.

Class 7. Specimen Plant of Aloe—First premium, Mrs. Amos S. Parke, East Saginaw, \$1; second premium, Mrs. Alicia Forsyth, Saginaw City, 50c.; third premium, Fred H. Herbert, 25c.

Class 10. Specimen Plant of Abutilon—First premium, Mrs. Amos S. Parke, East Saginaw, \$1.

Class 13. Specimen Plant of Oleander—First premium, I. Dyckmann, East Saginaw, \$1; first premium, Mrs. W. H. Frost, South Saginaw, \$1.

NOTE—The committee were not able to decide which was the better, and gave each a first premium.

Class 16. Flowering Begonia—First premium, Mrs. Alicia Forsyth, Saginaw City, \$1; second premium, Mrs. Amos S. Parke, East Saginaw, 50c.

Class 17. Specimen Plant of Hoya—First premium, Mrs. Alicia Forsyth, Saginaw City, \$1.

Class 19. Specimen Plant of Pimento—First premium, Mrs. Amos S. Parke, East Saginaw, \$1.

Class 19. Specimen Plant of Sea Onion—First premium, Mrs. Julia Bare, East Saginaw, \$1.

Class 22. Hanging Basket filled—First premium, I. Dyckmann, East Saginaw, \$3.

Class 23. Wardian Case filled—First premium, Egbert A. Guild, East Saginaw, \$2; first premium, Mrs. Alicia Forsyth, Saginaw City, \$2; first premium, Mrs. Amos S. Parke, East Saginaw, \$2.

NOTE—The committee considered all the Wardian cases worthy of first premiums.

Garden Case filled—First premium, Mrs. A. S. Parke, East Saginaw, \$2.

Committee—Mrs. William Goff, East Saginaw; Mrs. L. P. Mason, East Saginaw; Thomas Wilde, Berlin, Ottawa county.

DIVISION S.—BEDDING PLANTS.

Class 1. Collection and Display of Verbenas—First premium, I. Dyckmann, East Saginaw, \$5; second premium, John Ford & Son, Detroit, \$3.

Class 2. Collection and Display of Dahlias—First premium, John Ford & Son, Detroit, \$5; second premium, Thomas Wilde, Berlin, Ottawa county, \$3.

Class 4. Collection and Display of Geraniums—First premium, I. Dyckmann, East Saginaw, \$5.

Class 6. Collection and Display of Lantanas—First premium, I. Dyckmann, East Saginaw, \$3; second premium, Mrs. Alicia Forsyth, Saginaw City, \$1.

Class 9. Collection and Display of Petunias—First premium, Mrs. William Rowe, Walker, Kent county, \$3; second premium, Mrs. D. F. Rose, East Saginaw, \$1.

Class 10. Collection and Display of Asters—First premium, Thomas Wilde, Berlin, Ottawa county, \$3; second premium, John Ford & Son, Detroit, \$2.

Class 11. Collection and display of Dianthus—First premium, I. Dyckmann, East Saginaw, \$3.

Class 15. Collection and display of German Stock—First premium, Thomas Wilde, Berlin, Ottawa county, \$3; second premium, Mrs. Wm. Rowe, Walker, Kent county, \$2.

Class 18. Collection and display of Zinnias—First premium, Thomas Wilde, Berlin, Ottawa county, \$3; second premium, John Ford & Son, Detroit, \$1.

Class 19. Collection and display of Everlasting Flowers—First premium, Mrs. Wm. Rowe, Walker, Kent county, \$3; second premium, I. Dyckmann, Saginaw, \$1.

Class 21. Display of Coxcombs—First premium, Mrs. Wm. Rowe, Walker, Kent county, \$2; second premium, Thomas Wilde, Berlin, Ottawa county, \$1.

Class 22. Collection and display of Phlox Drummondii—First premium, Thomas Wilde, Berlin, Ottawa county, 3; second premium, I. Dyckmann, East Saginaw, \$1.

Class 24. Collection and Display of Ornamental Grasses—First premium, Mrs. William Rowe, Walker, Kent county, \$3.

Class 25. Collection and Display of Scabiosas—First Premium, I. Dyckmann, East Saginaw, \$2.

Special Castor Bean—First premium, Frederick Harris, East Saginaw, \$1.

Committee—Mrs. H. Dale Adams, Comstock; Mrs. Chilson, Battle Creek; Mrs. A. A. Parsons, Saginaw City.

DIVISION F.—FLORAL DESIGNS.

Class 1. Floral Design for Decoration of Large Room or Hall—First premium, Mrs. Amos S. Parke, East Saginaw, \$5.

Class 2. Arrangement of Fruit and Flowers for Table—First premium, Mrs. William Rowe, Walker, Kent county, \$3.

Class 4. Small Floral Design of any kind—First premium, Mrs. William Rowe, Walker, Kent county, \$3.

Class 5. Pair of Bouquets Arranged in Formal Method—First premium, I. Dyckmann, East Saginaw, \$2; second premium, Fred Waltz, Detroit, \$1.

Class 6. Pair of Bouquets Arranged in Natural and Graceful Style—First premium, L. P. Mason, East Saginaw, \$2; second premium, I. Dyckmann, East Saginaw, \$1.

Class 7. Basket of Flowers for Table—First premium, Mrs. Barbara Kellerman, New Buffalo, \$2.

Class 8. Bouquet of Dried Grasses and Flowers—First premium, Mrs. William Rowe, Walker, Kent county, \$2; second premium, Mrs. Barbara Kellerman, New Buffalo, \$1.

Class 9. Hanging Basket of Cut Flowers—First premium, I. Dyckmann, East Saginaw, \$2.

Class 11. Dish or Basket of Cut Flowers—First premium, Mrs. A. W. Wright, Saginaw City, \$2.

Class Special. Flat Bouquet—First premium, Mrs. D. F. Rose, East Saginaw, \$2.

Class Special. Night-Blooming Cereus Preserved in Alcohol—First premium, Mrs. A. Forsyth, Saginaw, \$2.

Class Special. Ornamental Moss Goods—Second premium, Mrs. Barbara Kellerman, New Buffalo, \$1.

Special Award. Four Cages of Birds—First premium, E. F. Guild, East Saginaw, \$1.

Committee—Mrs. H. D. Tracy, Old Mission; Mrs. Abbot, Lausling; Mrs. John Estabrook, East Saginaw.

VICK'S SPECIAL.

Collection of Flowers from seeds grown or imported by Vick.

Thomas Wilde, Berlin, Ottawa county, first premium on Asters, Verbenas, Phlox Drummondii and Coxcombs, etc.

Mrs. William Rowe, Walker, Kent county, second premium for Zinnias, Ten weeks stock, Pansies and Balsams, etc.

Committee—Mrs. A. S. Parke, East Saginaw; Mrs. L. P. Mason, East Saginaw.

THE FRUIT AND FLOWERS AT THE STATE FAIR.

From the East Saginaw Daily Courier, Sept. 22, 1874.

With this issue we publish the premiums awarded in the Pomological Department at the State Fair. It will be noticed that in the flower section the florists of Saginaw have drawn a large share of the premiums. To Mrs. Amos S. Parke was awarded \$43 50; to Mr. I. Dyckmann, \$67; to Mrs. A. Forsyth, \$52 50; to Mr. F. H. Herbert, \$9 25, and small sums to other exhibitors. The large central floral design of Mrs. Parke was the masterpiece of the exhibition, and has never been excelled at any Michigan State Fair for massiveness of character and elaborate workmanship. The fountain contributed by Mrs. David H. Jerome added much to the attractiveness of the central stand. The flower of the night-blooming cereus, preserved in alcohol, sent by Mrs. Forsyth, had its constant crowd of admirers. Its petals set in a calyx of golden yellow within, encircling a number of incurved stamens, presented the appearance of exquisite wax-work. Said an enthusiastic spectator, "It looks good enough to be worshipped."

Mrs. C. J. Webber was awarded \$10 for her collection of plants.

The table of cut flowers shown by Thomas Wilde, of Ottawa county, was greatly admired, and he received \$38. This gentleman is one of the most promising florists in the State, an extensive fruit grower, and annually ships large quantities of strawberries.

For flowers, floral designs, and fruits, \$63 was paid Mr. and Mrs. Rowe, of Walker, Kent county, a township adjoining the city of Grand Rapids. The whole family, father and mother, sons and daughters, are florists and horticulturists, and greatly esteemed for their many excellent qualities of head and heart.

The collection of ornamental moss goods shown by Mrs. Barbara Kellerman, of New Buffalo, brought that lady near \$200, and her sales would have been larger had she brought the goods.

The table of floral designs was never beaten in the State for exquisite beauty, extensive variety and delicate finish. Mrs. L. P. Mason, Mrs. A. W. Wright, Mrs. D. F. Rose, Mrs. I. Dyckmann, Mrs. Wm. Rowe, and others, were rewarded with the blue and red, the two very popular colors of the fair.

The brilliant array of Gladioli, Asters, Dahlias, Phlox, etc., from the wonderful gardens of Mr. James Vick, of Rochester, N. Y., was the recipient of constant ejaculations of delight and surprise from the thousands that crowded this hall. Mr. Vick received a life membership from the society.

A large exhibition of flowers was expected from Detroit, but only John Ford & Sons were represented.

Taken altogether, the floral display was creditable to the ladies and gentlemen therein interested. We are glad to learn that many of them have already commenced work for the exhibition of 1875. May equal success, satisfaction and pleasure crown their disinterested efforts, and may the pure and healthy influences of this heavenly work ever reward its enthusiastic votaries. Much credit is due Prof. W. W. Tracy, for the arrangement of the tables.

We have brief space for the mention of the Fruit Department. Monroe county was the banner county for fruits; her extensive vineyards and nurseries were well accommodated by that grand railroad corporation with a soul,—the Flint & Pere Marquette Railway, and from Monroe to Fruit Hall was an easy journey, without change and without delay. Monroe county came in her glory

and pride with her best men and best fruits, and received premiums for her unrivaled grapes, and for her pears and apples. Two hundred dollars were paid to gentlemen from that county for fruit premiums.

Saginaw county need not be ashamed of her second premium on county collection of grapes, and Mr. Geddes seemed well pleased with the red that was placed on his collection.

The first premium on single varieties of plums was awarded to a citizen of Saginaw, Mr. L. P. Mason. Another northern and new county, Oceana, bore off the well-earned trophy of first premium for collection of plums, as well as for the best specimen of Early Crawford peach.

The Grand Traverse section was alike honored by her specimen men, women and fruits.

The collection of preserved fruits and jellies exhibited by P. Allyn, of Traverse City, was the largest ever shown at a fair in the State by a single individual, and brought the owner nearly \$100.

All agreed that the award of first premium to Peninsula township, Grand Traverse county, for township collection of apples, was just and righteously deserved.

The man who took the largest amount of money awarded on fruit was a gray-haired, veteran fruit culturist of seventy-two years, John Gilbert, of Ovid, Clinton county. His fruit was fair, well colored, hard, and free from insects. The good old man says this is probably his last State Fair, but we hope to greet him at the next; and may it be his fortune to win another \$50 for the best county collection of apples. Heaven bless these, the old and honored pioneers of Michigan!

A check of \$61 was handed the Messrs. Chilson, of Battle Creek, for their display, and the Grangers of Calhoun county need never be ashamed of their representatives.

One of the best collections of apples in the Hall was that shown by E. P. Flanders, of Galesburg, Kalamazoo county, and he received \$27.

Another collection was that from Tuscola county, awarded \$30, and so well pleased were the Tuscola friends that they took a life membership for Wm. Johnson, the President of the Tuscola County Agricultural Society, and a large number of annual memberships, sufficient to entitle them to 100 volumes of the Annual Report for 1874.

H. B. Chapman, of Reading, Hillsdale county, took \$10 and a life membership for his peaches and pears.

John C. Zeigler, of Saginaw City, for grapes, wine, and his garden, received \$10, and this Mr. Zeigler invested in a life membership.

The largest and best exhibition of dried fruit, etc., was made by L. C. Lincoln, of Greenville, Montcalm county, and he was paid \$13 therefor.

The display of peaches and fruit made by the Lake Shore Pomological Society at Douglass, Allegan county, through its secretary, Wm. Cummings, Esq., was awarded first prize of \$15. This was mostly from the town of Ganges, a town north of South Haven, and one of the most promising fruit sections in the State.

Spring Lake was represented by her large-hearted lumberman and fruit grower, Hunter Savidge, Esq., and to him was awarded, for his display of grapes and peaches, the premium chromo, "Boy with Basket of Peaches," from Mr. A. F. Dixon's collection.

Mr. A. F. Dixon, East Saginaw, was awarded \$20 for his display of pictures, and he certainly deserves well from the citizens of Saginaw for his enterprise.

THE NOMENCLATURE OF THE STATE FAIR.

BY GEORGE PARMELEE.

The committee on nomenclature would respectfully report that they have examined all the fruit on exhibition as carefully as the time would permit.

Owing to dilatoriness on the part of some exhibitors, and the haste of some to take away or dispose of their fruit, the committee had no more than three days in which it was practicable to work.

On invitation, Mr. Adair, of Detroit, and Mr. Bradfield, of Ada, joined us in our work and rendered valuable aid.

On the collections of plums we could do but little that was satisfactory to us or useful to exhibitors, from the fact that most of the fruit was past its season and had had but little pains taken to preserve its freshness. Especially was this true of varieties of the Gage family, and some were doubtless new seedlings from the same class of plums.

Of the names of peaches we found but few to correct. Of grapes we can say the same, and considering the great number of varieties shown, the nomenclature was very creditable to the growers. On pears and apples we had the larger part of our work.

One fault was noticeable in most collections of both these classes of fruits. We refer to the quite frequent absence of *stems*. It may seem a small matter, but with many varieties the stem is a characteristic feature. They should be unjointed where they unite with the spur or twig, and, your committee may add, the same rule is very important in picking fruit for late keeping. No apple or pear will keep well with the stem pulled out. We would urge exhibitors, when picking fruit, to preserve this small but distinguishing part; to remember that color, form, and russet are some of the unreliable marks, while the dots, the calyx and basin, the stem and cavity, are much more reliable.

There were present large collections from the extremes of the Lower Peninsula,—points 250 miles apart,—and the differences in color, form, and russet in some varieties was enough to completely disguise them to persons acquainted with them in only their own locality, the Roxbury Russet from some parts being found smooth as a Greening, and again with a deep red cheek. The Fall Pippin in some places is yellow all over, and in other sections yellow with bright red cheek. So also of the Porter, Swaar, and others. In form the Ben Davis, for instance, changes from angular and nearly flat in one part to smooth and elongated conic in another, so wide is our range of latitude and so varied our conditions of climate and soil. We hope future exhibitors will remember the importance of preserving this distinguishing appendage. A fat Skorthorn steer, minus a tail, can hardly look more incongruous to a stock fancier than a nice pear or apple, minus a stem, does to a fruit man. He sees in it what a gardener sees in a plugged melon,—premature decay. It is not perfect.

Owing to the long drouth in some parts of the State, some pears imperfectly developed were shown. In such cases the Committee did not think best to venture on names.

In the names of apples, the most common of fruits, we found most confusion. Here, as at other fairs, the fact was perfectly patent that utterly worthless varieties are grown all over the State. Our Society has at various times raised its voice against the careless selection of varieties. But men plant trees who never heard of this society, and many more there are who never read a report of its meetings. Of what use to such is our combined experience? Our members will, to a great extent, correct this evil in their own planting, but we see the need of extending our membership and influence.

The reputation of Michigan as a fruit State is important to all who have fruit to sell. Give us the name of raising the best fruits, and we get with it greater competition in buying and better prices. It seems to be the province of this society to lift the State to the position nature intended her for—the head of the list of fruit States in the Union.

In no way is the help of the society needed more than in teaching the importance of planting standard sorts. We found collections well named in some instances, in some not. In the collection from Grand Traverse were some which the committee were unable to name; one sort in particular, the trees of which were brought from Rochester, N. Y., about fourteen years ago, and which is in many orchards about the Bay, has been to all the fairs of this society, was taken last year to the New York Farmers' Club, was shown to Mr. Chas. Downing, and to Messrs. Ellwanger & Barry, but no fruit man has ventured to give it a name. It seems to be a remarkable case of transformation by local influences.

It was made the duty of this committee to award a premium to the best named collection of fruit. This we had no difficulty in determining, and it gives us pleasure to award it to a collection which was perfectly named, if, perhaps, we except one variety of apples, about which the committee were divided in opinion. The collection embraced a large number of pears as well as apples, and was shown by Messrs. Ilgenfritz, of Monroe.

Committee—George Parmelee, C. N. Merriman, I. E. Ilgenfritz.

DISCUSSIONS OF THE PENINSULA FARMERS' CLUB.

OFFICERS FOR 1874.

President—J. E. Savage.

Recording Secretary—E. H. McCallum.

Vice-President—W. A. Marshall.

Corresponding Secretary—George L. Roberts.

Treasurer—George Parmelee.

OFFICERS FOR 1875.

President—B. Montague.

Vice-President—W. A. Marshall.

Recording Secretary—George L. Roberts.

Corresponding Secretary—W. W. Tracy.

Treasurer—George Parmelee.

Executive Committee—The President and Secretaries.

CONSTITUTION.

ARTICLE 1. This organization shall be known as the Peninsula Farmers' Club.

ART. 2. The object of this society shall be,—first, to promote a free and general discussion of agricultural subjects among its members; and second, to advance the general interests of the farmers and fruit growers of Grand Traverse.

ART. 3. Any person may become a member of this society by signing the constitution and conforming to the regulations of the society. Such members may withdraw from the society by simply requesting the secretary to erase their names from the roll.

ART. 4. The officers of this society shall consist of a president, vice-president, recording secretary, corresponding secretary, and treasurer; all of whom shall hold office until their successors are elected. Any vacancy occurring shall be filled by a special election, by ballot, at the next succeeding regular meeting of the society.

ART. 5. The annual meeting of the society shall be held the last Friday in November of each year, when officers for the succeeding year shall be elected by ballot. A regular meeting may be called at any time by the president and secretary of the society.

ART. 6. Amendments to this constitution may be presented at any regular meeting, said amendments to be acted upon at the next succeeding regular meeting, and to take effect immediately upon receiving a two-thirds vote of the members present.

NOTE.—The Peninsula Farmers' Club of Old Mission, Grand Traverse county, Michigan, is one of the most useful organizations of the kind in the State. This peninsula in Traverse Bay is about eighteen miles long by about two wide, and is well adapted to fruit culture. It will be seen, also, from the discussions, that attention is given to a general system of agriculture.

THE MOST PROFITABLE CROPS AT OLD MISSION.

OLD MISSION, December 8, 1873.

The club met at 6½ o'clock P. M., Mr. J. E. Savage in the chair, E. H. McCallum, Secretary. Subject for discussion: What farm crops were found most profitable during the past season, and what were the causes of their being so?

The chairman proceeded to open the discussion of the evening by reading the following address:

GENTLEMEN:—There are certain crops which it seems incumbent on us to raise whether they pay or not, so to speak. These crops are something to eat ourselves, and something to feed our horses, cattle, sheep, and hogs on. In these days "hog and hominy" has played out,—not the hog but the hominy; although I am inclined to believe that if there were less hog and more hominy eaten, mankind would be all the more healthy for it. Flour, potatoes, and pork seem to be the main food for the farmers of to-day. Wheat, therefore, is one of the crops that it is necessary to raise, and it is one of the crops that generally pay, especially winter wheat. As to the kind that best pays, it probably rests between the Diehl and the Soule, some preferring the one and some the other. It is said by some that the Soule wheat having the thinner skin yields more flour to the bushel than the Diehl. Last fall I had 600 pounds, or ten bushels, of Diehl wheat ground: the yield after the toll was taken was 425 pounds of first quality flour, or 42½ pounds to the bushel. If we allow one tenth for toll the yield would be 47½ pounds to the bushel, which is 7½ pounds above the average yield of wheat, so I am told by the millers.

As to potatoes, I think the Peachblow is the best for these reasons:

First, it yields about as much as any other good variety; second, its quality is best; third, it is well and favorably known in the markets, and brings the highest price. For an early potato, grown on sandy soil, I prefer the Early Rose.

For food for farm animals I think the most profitable crops are corn and clover. I have raised several kinds of corn in the last five years, including the early eight-row Vermont, the large eight-row yellow, white flint, Sanford, Ohio dent, and a kind I obtained in Wisconsin called the Brindle dent. The Vermont corn was too small and did not yield enough, though the fodder was good. The eight-row yellow and white flint yield well, but are very hard to husk. The Ohio dent and Sanford corn are too late for us here. But the Brindle dent is, I think, the best of all, because, first, it yields well; secondly, it is as early as white flint or eight-row yellow, and that is early enough to insure its ripening every year if planted in season. The first year I raised it, it ripened in 90 days from planting. Last year was not so good as a corn year, and it took longer, although some I planted the 11th of June ripened perfectly. Thirdly, it is easy to husk. I had rather husk six bushels of it than five of the eight-row corn. I mentioned clover as a profitable food for stock, both on account of its qualities as food and its benefit to the land.

Prof. Tracy.—Not having made up my accounts for the year I cannot state definitely which of my crops have proved most profitable; but I am convinced that we shall find it more remunerative to raise the finer products than *general farm crops*. Our climate and soil are well adapted to the production of several of the fine products. We cannot compete *favorably* with the large farm-

ers of the west in the production of "general farm products," they being enabled to employ the most approved labor-saving implements on their large farms which it would not pay us to use on our small ones, could we afford to procure them. This rule does not apply to the finer products, as there is no expensive machinery or implements needed to raise them to perfection, which is not within the reach of us all. What I mean by *fine* crops are squashes, celery, onions, etc.

As an example of the profitableness of these products let us take the squash. The last season I grew this vegetable from seeds selected from vines grown in Mr. George Parmelee's garden, choosing, not the largest *individual squashes*, but the *best squashes* from the *best vines*, to take my seed from. On account of the drought my sowing resulted in a one-third crop, and even this estimate will give me a return profit of from \$45 to \$65 per acre; and if my squashes had turned out as well as those my seed came from, and could be sold at the Boston market price, viz., six cents per pound, they would realize \$1,800 to the acre.

Celery is another vegetable which succeeds well here, and could be grown profitably. It can be shipped readily and always finds a good market.

Although I have not had time to experiment with onions since I came here, I believe that they also might be profitably grown. The want of local markets for these products, and the difficulty at present experienced in shipping them abroad, are not,—as thought by some,—insurmountable obstacles in the way of growing them. When we raise a sufficient quantity of these or any other produce, and raise them steadily, purchasers will come in and buy them and provide means of shipping them.

Mr. Brinkman.—What is the average weight of the Hubbard squash as grown here?

Mr. Tracy.—From eight to ten pounds.

Mr. Avery.—When at Detroit this fall, a quantity of squashes had been sent to a friend of mine there for sale. The heaviest of them weighed nine pounds, the average weight being five pounds. They sold at \$15 per hundred. I found at Buffalo they were selling at \$2 per hundred.

Mr. Tracy.—With regard to price, I will say that at \$20 per ton they would pay \$40 per acre, which, considering that they cost but little labor and expense to plant and cultivate, and no trouble to harvest, is a greater margin than most farm crops give.

Mr. Pratt.—Is there any other than the Hubbard squash which it is profitable to raise for market?

Mr. Tracy.—Yes; the Boston Marrow.

Mr. Gray.—I think the Marblehead is preferable to the Hubbard, and that the Turban is in some respects better than the Boston Marrow.

Mr. Pratt.—I brought the first Hubbard squash seed to this region. I may say here that I bought them for a penny each. I have grown them successively for several years. My method of planting is in hills two rods apart, and four stalks to the hill. I do not think they would do well in drills. Latterly I have planted the Turban, which I like better than the Hubbard. It is much sweeter, but does not keep so long. I am inclined to believe that heavy manuring is rather injurious than beneficial in raising squashes.

Mr. Tracy.—Has any member present succeeded in raising a good crop of well-ripened onions in this region?

Mr. Pratt.—Although I came from an onion country, and have had some

experience in raising them, I have never succeeded in growing them here to perfection; but I have seen some good onions grown here.

Mr. Tracy.—Good onions or good crops?

Mr. Pratt.—Good crops and good onions.

Mr. Tracy.—To be profitable the entire crop must be good. Not more than two bushels to the acre should be unmarketable. Unless put into the market dry and in good shape they are unsalable.

Mr. B. Montague.—I have never raised onions before. Spring of last year I sowed Yellow Danvers. I found the crop did not ripen, but kept on growing. I believe the cause of this was their being sown too late. Last spring I sowed thick and early. My Yellow Danvers ripened and were good, solid onions, nice as I ever saw; but the yield was small. My red onions did not ripen. My brother raises onions on this peninsula which ripen and succeed well in every respect, and I believe this crop would always prove successful if sown early and the ground kept in a high state of cultivation. I do not know whether they may be said to pay; but I *do* know that mine cost fifty cents per bushel to raise, and sold for one dollar,—and I consider that onions paid me *best*. Peas pay well,—better I believe than any grain crop, as they require less cultivation. The plan I adopt with them is to sow on potato ground, and thresh them by treading out with my horses. I find this method of threshing cheaper than by machine. I can thresh thus three loads of twelve bushels to the load in one afternoon. Another reason why I think peas a profitable crop, is that coming in early they enable us to fatten our hogs in season. Peas are less exhaustive to the land than oats and some other grain crops. They are in this respect something like clover. I plant two kinds of peas, the Black-eyed Marrowfat and the common field pea. Of the former variety the yield this year was eleven bushels to fifty rods of land. I consider corn a profitable crop to raise in a young orchard,—much better than potatoes. I planted the King Philip this year and had a good crop. I like this variety better than dent, but it is very hard to husk.

Mr. Avery, having shown fine specimens of clover and timothy hay, remarkable for their freshness and sweetness, retaining even the bloom on the flowers of the former, said: "My best paying crop this year was hay. Counting it at six dollars per ton I consider it netted 100 per cent profit. Some of my wheat crop cost me one dollar, and some sixty cents per bushel, and netted forty cents per bushel over cost of growing. Potatoes cost me twenty-five cents per bushel. Corn proved a failure with me this year. With regard to corn, I would suggest to the Club not to husk it, but feed it in the stalk. When kept so, it does not become hard and dry as when husked; and the labor of husking, cribbing, etc., being thus avoided, a saving of one-fourth the cost of the corn is effected. I am of opinion that we cannot grow crops profitably that require reshipping, unless they be early. My best paying small crop this year was "Wilson's Early" blackberries. The yield was one quart to the hill. I believe that if a drying or canning establishment were opened in this region this would prove one of the most profitable crops to grow, as would also black currants. There is a growing demand for this latter fruit: converted into jam and jelly it is much used for medicinal purposes. The flesh of this berry being firmer than that of most of our small fruits, it is more easily handled than they are.

Mr. Brinkman.—With regard to the price of squashes, I would say I sold mine at ten cents each, and can make money at that price.

Mr. Pratt.—Squashes and other vegetables grown in this region are very highly esteemed, and sought after in the Lake Superior region. I believe that it would prove profitable to raise sufficient to make a market, as I am persuaded that purchasers would be found to buy all we could produce.

Mr. Avery.—What time do squashes ripen here?

Mr. Pratt.—The time of ripening differs, but is generally late in September or early in October.

Mr. Avery.—Mr. Moore, of Detroit, who received potatoes from here last year, wants more this year. He assured me that he cannot find any as good as ours.

Mr. Brinkman.—We can generally afford to raise potatoes to sell at twenty-five cents a bushel and clear twenty-five dollars per acre. This year, although one crop was small, I netted nearly thirty-six dollars to the acre, my potatoes costing me twenty dollars, delivered at the dock, my receipts being fifty-six dollars per 125 bushels, the average yield per acre. My carrots succeeded well this year. I sowed a patch of twenty-four rods, from which I have sold twelve dollars' worth, have twenty-eight bushels in my cellar, and consider that I have not yet harvested half of the crop. The variety white Belgian, sown on clay soil, and gathered by hand.

Mr. Montague.—My potatoe crop resulted in a yield of 150 bushels to the acre. I plant in hills four feet apart. My potatoes cost me twenty-five cents a bushel. I advise the farmers of this club to raise, annually, three or four acres each.

Mr. M. Sweeny.—My yield of peas this year was twenty-five bushels to the acre. I believe they are a more profitable crop than corn, especially for feeding hogs.

Mr. Brinkman.—My peas yielded twenty-seven bushels to the acre at a cost of seven dollars. They were threshed by machine, which I consider better than treading out. I believe peas to be more profitable than corn for feeding hogs.

Mr. Gill.—If peas are taken dry from the field they can be easily and profitably threshed by machine; but if allowed to remain in the "mow" till they become sweaty, they can be threshed better and cheaper by hand than by machine.

THE BEST CROPS TO GROW AT OLD MISSION.

OLD MISSION, December 15, 1873.

The club met at 6.30 P. M., Mr. J. E. Savage in the chair.

E. B. McCallum, recording secretary.

Subject for discussion: "In view of the success of the past, and our facilities for shipping, what are the best crops for us to grow next year?"

Mr. Will W. Tracy proceeded to open the subject for the evening with the following address:

MR. PRESIDENT AND GENTLEMEN:—In bringing before you the subject selected for discussion this evening, I will confine my remarks to one or two of the principles that underlie the question and are independent of the immediate profitableness of crops or their effect upon the soil. These particulars may be more ably discussed by those among you who are more experienced than I am.

First—We should grow those crops which are best suited to our tastes, because, other things being equal, we shall succeed best with such crops. No one can succeed in an undertaking in which he has no interest, or in a work for which he has no love. It is not the farmer who is constantly talking about *farming not paying*, or of the hard life of a farmer, who succeeds; but the one who goes at his work enthusiastically, and delights in doing it. A grumbling, dissatisfied spirit is far more often the *cause* than the *effect* of non-success.

Second—We should grow those crops which our climate and soil will produce in unusual or greatest perfection; and which, from the formation of the surface or other causes, we are enabled to grow cheapest, as compared with other localities. There is always a market at good prices for the best produce, even when medium cannot be sold at any price. If, then, our soil and climate will produce a very superior article of any kind, we shall find it more profitable to cultivate that article than those from which we can produce only a medium quality.

Third—Other things being equal, that crop will prove most profitable of which, by the least combination, we can control the largest share of the market. On this principle let us consider some of the staple articles of produce. First,—Wheat. Our wheat is certainly of extra good quality, and the yield per acre is good; but our farms are all small and we can find but few contiguous acres which are level and smooth enough to permit of the profitable use of the labor-saving machines which in some localities are so advantageously employed. Suppose we only have a rise of 50 feet across a square field of 160 acres; this will, by calculation of the amount considered, give from eight to sixteen minutes of horse labor per acre (equal to one horse power) extra, for the simple matter of cutting with a reaper. Again, our maximum production of wheat would be but 1-125th part of the product of this State, and 1-1900th part of that of the whole country, an amount so small that it would give us little or no power in securing prices. Corn we cannot grow in so large quantities, or so good quality, or so cheaply as it can be grown in Illinois and other sections. I may say the same of oats, while potatoes grown here are fully equal in quality to any grown in America, and can be produced as cheap or cheaper than elsewhere; and our maximum production would give us 1-120th part of the crop of this State, and 1-800th part of that of the United States, which would be a sufficiently large proportion to enable us to do much towards affecting the market. In these remarks I have omitted the mention of *fruit*, because I believe that we all agree that this is our best staple, and that we have now under consideration what *farm* crops it is most profitable for us to grow until our fruit trees come into full bearing. I would add in conclusion that the rules given are not to be taken singly, but each with many others, such as a proper rotation and diversity of crops, the effect of those crops upon the soil, a proper succession of labor, etc. All of which must be taken into consideration in making our decision as to which are the best crops for us to grow next year.

Mr. Avery.—I would suggest white Swede turnips as a profitable crop to grow next year. While I was at Milwaukee last year they were selling at sixty cents per bushel. A gentleman then told me that he had raised 2,000 bushels, all of which he had sold readily at that price. At Buffalo they sell at fifty to sixty cents; and at Detroit they bring readily potato price. Fruit men at the places mentioned inform me that they can dispose of any quantity at these prices. With regard to specialties, I would say that they are good in theory

but difficult in practice. Near large cities, where labor is readily and reasonably obtained, one may succeed with them; but here where labor is not easily procured I only believe in specialties to a very limited extent. In choosing our crops we must not lose sight of the fact that our soil needs to be brought to a higher state of cultivation, and that the way to accomplish this is by enriching it with manure. Our fruit trees need fertilization; other fertilizers not being accessible we must depend on our barn-yards, and grow a large proportion of crops that are convertible into manure there. I will mention corn and grass for this purpose. I would recommend the production of potatoes as remunerative. Squashes might also be profitably grown, but we must rely on those crops as most profitable for which we receive the greatest amount of dollars and cents, unless they at the same time tend to enrich our soil and bring our farms into better condition.

Mr. Tracy.—What success did Mr. Grey meet with in growing sweet corn this year?

Mr. Grey.—My sweet corn resulted in a one-fourth crop.

Mr. Curtis.—I plant sweet corn in hills. By selecting early kinds and planting early I always have good crops. But I only plant a small quantity for family use. Common corn failed this year; but I believe as good corn can be grown here as "ever grew in Egypt." Owing to the early snows I was obliged to store my corn damp this year. My horses and cattle seem to prefer it so to being dry. They eat the wet stalks up clean and will leave even hay for them. Mr. Montague realized 100 bushels of corn per acre this year, yet I do not believe we can yet afford to raise it for market.

Mr. Grey.—Does any one know of tests by chemical analysis having been made of the relative nutritive properties of sweet and common corn?

Mr. Tracy.—Dr. Miles, of the State Agricultural College, has made such tests, but I am not prepared to say with what result.

Mr. Avery.—Although sweet corn when properly cured is better than common corn for fodder, the former costs so much more trouble to raise than the latter that I believe the advantages in growing them are equal. I believe in corn for fodder; but not in feeding stock on it exclusively. They need change of diet.

Mr. Tracy.—I believe it profitable to grow fodder corn. My "Dent" was drawn in wet, and my cattle thrive on it. I like "Dent" better than any other corn except "Smut-nose," which ripens earlier.

Mr. George Parmelee.—With regard to the nutritive properties of corn fodder I would say that much depends on the time of cutting. If cut while green, and consequently before the grain fills, it is more nutritive than when allowed to fully ripen. I think it necessary for the well-being of cattle to vary their food. I concur in Mr. Tracy's opinion that apples and corn cannot generally be favorably grown in the same locality. Apples grown on the shores of a large sheet of water always succeed better than those grown in the interior of the country. Corn on the contrary does better in the interior than in the vicinity of water.

Mr. Porter.—I believe milch cows do better on corn fodder than any other, and that common corn is more nutritive than sweet corn. I like "Smut-nose" best for fodder. It grows high and slim, and the cattle eat most of the canes.

Mr. Montague.—I prefer "Dent" to all other corn as fodder. It yields well, and the cattle like it. I should like to know what crops we are to raise next

year. We must of necessity grow some wheat, corn, and peas; and I agree with Mr. Tracy that if we can market squashes and sweet corn we had better grow them, for they cost but little trouble to raise. Turnips and potatoes succeed well; but we have difficulty in marketing them.

Mr. Parmelee.—Few turnips are grown in the vicinity of Chicago. If put into the market there in May, when other vegetables are scarce, they command a good price.

Mr. Avery.—With regard to potatoes, I believe it would be more profitable to raise more Early Rose and not so many Peachblows. The former are more easily harvested than the latter, and, coming in earlier, might be made more profitable.

CO-OPERATION AMONG FRUIT GROWERS.

OLD MISSION, Dec. 22, 1873.

The club met at 6.30 P. M., Mr. J. E. Savage in the chair.

E. H. McCallum, secretary.

Subject for discussion: What arrangements can we make by co-operation or other plan to prevent our fruit from being thrown on the market at unsuitable times and at ruinous prices.

After the reading and adoption of the minutes of the last meeting, Mr. Curtis opened the discussion of the evening by delivering the following address:

MR. PRESIDENT AND GENTLEMEN:—Fruit grown in the Grand Traverse country costs more than that grown in old settled portions of the State, and should sell for a higher price. We labor under the disadvantages incident to a new country. In the main our land is new, we have to work among stumps, roots and grubs. The use of machinery is out of the question that is easily operated where these obstructions do not exist. Labor is high, we have to pay outside prices for stock, with the expense of getting it here added. The same is true of all our tools and agricultural implements. Little is manufactured here. A small portion only of the stock needed is grown here. These and other considerations make fruit-growing and other agricultural operations expensive. While we labor under these disadvantages we are fairly entitled to all incidental counter-balancing advantages. These are freight on imported fruits, and the attendant losses of bringing it in, local scarcity and superior quality of the home article. These are some of the conditions in our favor which naturally make our fruits higher than the same kinds, but of inferior quality, in the regions where grown. It is just that we should have higher prices. We are not in any way wicked when we ask and secure such extra compensation. There is danger of our losing this. Early ripening, perishable fruits must be disposed of at about the time when they mature. They cannot be held. If a surplus is produced it must go for what it will fetch, or it must be preserved by canning or drying, or both. In this view we should heartily second any enterprise for erecting such establishments among us. Again, we are in danger of losing by too much being forced upon the market at a time, and by putting upon the market such kinds as are not at that time in demand.

What can we do to remedy these evils? Obviously no more of the fruits that perish soon after ripening must be offered than is required to supply the demand. Prices go down under the influence of a small surplus, at a very rapid rate. Only a few more baskets of peaches or pounds of grapes, or boxes of berries than the market requires are needed to set the prices of these fruits tumbling. If a few be sold late in the day at a reduced price, the reduction is almost certain to be established for the next day. This becomes inevitable if it is known that there is an abundant crop or a small surplus. But how can we find the gauge of the correct quantity? We cannot. We can't tell how much will be needed. We can't tell how much will be produced. We can't tell, when we plant, anything about the fruitfulness of the seasons that are to follow. And here, very opportunely indeed, comes the drying and canning establishments. They can take the surplus and put it into such shapes as to defy the action of the elements or the lapse of time. And so I again repeat, let us have these establishments as soon as possible, and in order to secure them, obviously, we should guarantee any amount of patronage that may be reasonably required. But some are sacrificing in their long-keeping apples. Last fall there was quick sale for mature apples at a dollar a bushel; but parties at the same time were selling beautiful Baldwins and Greenings for \$2.50 per barrel. Such fruit has sold quickly in its season for \$4.00 during the last four years. It must certainly be worth as much from February next until it is gone. I inquired of one man why he was selling at such ruinous prices. His answer was that he wanted certain necessary articles for immediate use in his family. Herein lies a great difficulty. Such fruit is wanted as is fit for immediate use. Such as is not wanted must be sold at a sacrifice, if sold at all. Here the only remedy is to hold the fruit until it is wanted. Canning and drying do not help. But many can't hold it, or think they can't. Their necessities compel them to sell for what they can get. The influence of such sales is very depressing, as all must see. The best customers take advantage of such opportunities and lay in their season's supplies.

As remedies I suggest, first, fruit-growers should become intimately acquainted and know quite well the extent of each other's operations. An intimate acquaintance will enable all to understand what may be the pressing wants of each. It will give such confidence to ask advice, obtain information, and often pecuniary assistance, to a small extent, but sufficient to satisfy immediate wants. Second, may not receiving houses be established at convenient points, where fruit can be stored and held until the suitable time arrives for selling? Receipts for such fruits to be given, such receipts would sell for a minimum price in hand, a stipulation that the maximum should be paid when the fruit is sold, a small percentage for the accommodation; and it occurs to me that to make such a plan effective the fruit-growers should or could organize into a close association, and make these houses their agencies for receiving and taking care of all long-keeping fruit offered until the time arrives when it becomes advisable to sell. This is the briefest possible statement. I hope there is enough of it to lead to careful investigation. I have just given it thought enough to establish the opinion in my own mind that something practical and useful may grow out of it, but I should want considerable help to put it into running order.

Mr. Tracy.—There was such a society as Mr. Curtis describes organized at South Haven. I do not know what success it met with. I think it would be well for fruit men of this region to consult as to the varieties and amount of

their crops, and so the better know how to dispose of them. It would perhaps be well to appoint a committee to ascertain what trees are already set out, and what are to be set out next year. We should thus be enabled to make our future plans to the best advantage.

Mr. Avery.—In 1848 the Salina Bank was formed in connection with the salt works at Syracuse and operated on the principal proposed by Mr. Cartis. Its establishment resulted favorably to the salt producers of that region.

Mr. Tracy.—I would inquire of Mr. Parmelee if any co-operative societies exist at Benton Harbor.

Mr. Parmelee.—Several such societies were organized at Benton Harbor, none of which succeeded. It would no doubt be an advantage to those intending to plant to know what trees are already planted in this section of the country. It is possible that there are a great many more early fruit-bearing trees planted than we suppose there are. People often plant a greater proportion of early trees than they intend to. In sales of trees from my nursery I have remarked that too great a demand has been made for early trees. In small orders especially the proportion of summer and fall trees has been too large.

Mr. Tracy.—It is the small growers that spoil the market. Having but a small quantity of fruit to dispose of, the price of it is not a matter of so much importance to them as to the large growers; and they sell at a low rate rather than hold their fruit to enforce a better price.

Mr. Grey.—If co-operation was established how great an extent of territory would it comprise? If only the Peninsula, others in this region might frustrate our plans by selling at whatever time and price they please.

Mr. Parmelee.—I believe that many of the low prices paid for our fruits is owing to the miserable condition in which they are put on the market. I have seen fine apples shaken down from the trees. What wonder then if a reduction of 50 cents per bushel is made on these bruised apples from the price they should have brought if sent to market in good shape. Fruit, if presented for sale sound and well packed, will always bring a good price. And we need no co-operation to do this, as each farmer can store his own. Cellars can be built cheaply, and the long-keeping qualities of our winter apples will enable us to keep them till spring, when they realize from six to ten dollars a barrel at Chicago. As to our summer perishable fruits, we can send them to Escanaba.

In less than three years from this date boats will come into the bay for our fruit if we have enough of it to sell. There is no fear of the coming, for fruit-freight pays them well. In the early days of fruit-growing the same state of things existed at St. Joseph as we experience at present. We started with low prices. What we need more than co-operation is to instruct our fruit-growers that apples are worth caring for, and that they, and indeed all fruits, should be sent to market well packed. Very much depends on this matter of packing fruit,—more than a great many suppose. When a man puts up his fruit well and honestly it will sell at a good price. Another thing we need is a factory for the manufacture of barrels, boxes, and baskets to pack our fruit in.

Mr. Brinkman.—I have no doubt that canning and drying establishments would prove advantageous to us, but I do not think the same of co-operation. I believe in every man caring for and putting up his own fruit; he then knows what he has and what he sells.

Mr. Avery.—I do not believe co-operation necessary, except for small fruits. Winter apples will take care of themselves. Every man should take care of

his own fruit, put it up honestly, and take pains thus to earn a good reputation. He will then find purchasers.

Mr. Parmelee.—Owing to the non-arrival of baskets which I had ordered for my peaches last fall, I was obliged to put them up in other packages. The consequence was that I did not receive much more than half what I should have got for them. Michigan generally has a reputation for bad packing and short measure. I believe that it originated rather in the ignorance than "cuss-
edness" of the fruit-growers.

WINTER APPLES.

OLD MISSION, Dec. 29, 1873.

The Club met at 6½ P. M., Mr. Geo. L. Roberts in the chair.

Subject for discussion, "What constitutes a perfect winter apple, and how to obtain it?"

Mr. Geo. Parmelee opened the discussion of the evening with the following address:

MR. PRESIDENT AND GENTLEMEN:—Perfection, as applied to our winter apples, means simply comparison with our highest known standard of excellence. The points of excellence are quite numerous and are not all combined in any one apple; hence we may have many that come up to the standard on some point, while all are below in some particular quality. This leaves us without any apple that may be said to be perfect. To the Laplander, *any* apple that would withstand the cold and produce fruit would be prized above price. In countries where crab apples only will thrive, they are of superlative excellence; and, going to a little milder climate, where a few of the hardier apples will grow, those that survive best constitute the standard of excellence. It is only in a climate capable of growing all apples that we find all the points of quality to be appreciated. In such a climate, the apple country proper, men are apt to estimate varieties in reference to some point which they especially prize. A nurseryman favors a sort which grows perfectly. In a commercial orchard, the sort that produces most, if reliable, is esteemed highest. To the apple merchant, the one that brings the highest price is the perfect apple. To the hotel keeper, the perfect dessert apple is small, to avoid waste. The man who buys for his own table buys to suit his own taste; if he buys for the kitchen, he wants the apple which suits the housekeeper's particular way of cooking them. The drying factory requires the apple which is easiest prepared and makes the largest quantity of dried fruit of good quality. Those who esteem apples for dessert purposes prize most some peculiar flavor, and the general public differ widely as to what is the best or perfect flavor. Most apples in the long list of varieties have some admirers, but in most cases the preference is owing to a want of familiarity with many kinds, or to associations connected with earlier days, or to scarcity of other sorts at the time of making its acquaintance, to hunger, fatigue, or anything to make it particularly acceptable. While I believe in development, and expect a better apple than we yet have, I do not expect to see all the excellencies combined in one sort. I will name some of the points the perfect apple should have. It should grow

thriftily and straight in the nursery; in the orchard it should be a medium grower, and tend to keep a leader; its foliage should be healthy; it should bear young and annually, and not overbear; the fruit should be medium size, smooth, regular, beautiful, the skin should be strong, the flesh firm and juicy, the flavor sprightly and refreshing. It should be good for cooking, should make strong cider, and should remain a long time in perfection. An apple may have all the excellencies of fruit and be worthless from its faulty habit of tree growth, or from shy bearing, and also, though less commonly, from overbearing. An apple may be perfect in tree, bear early, annually, abundantly, a medium size, strong skinned, firm, regular, smooth and beautiful fruit, and with poor flavor be worthless. An apple may also have all the good qualities of tree and of fruit, and if its season of use is very short, it is of no value. The perfect winter apple should combine the good qualities of tree, productiveness, size, firmness, flavor and beauty, with the ability to keep readily without loss through the whole winter, and with little loss until the summer apples mature, keeping its flavor to the last. Such can be matured in mid-winter if wanted, by keeping in warm places. To us, situated on the great and cheapest highway between the East and the West, that apple which combines the most of the excellencies with the fewest and smallest deficiencies, is the perfect one, or, in other words, the one to plant. We may never agree upon the name of it, but if we bear these facts in mind we shall reject many sorts that are commonly planted. We want to raise large quantities of fruit that will sell, and that will cultivate the taste of consumers.

Let us use our means to the end, and we may justly take pride in raising the "perfect winter apple."

Mr. Pratt.—I would ask Mr. Parmelee if high cultivation tends to keep off insects, and whether they are more numerous where the land is seeded down?

Mr. Parmelee.—It has occurred to me that we should set apart an evening for the discussion of this subject. There are many ways of killing the "codling moth,"—by bands and cloths placed on the trees, etc.

Working the land late in the fall tends greatly to destroy insects. Pasturing hogs in the orchards also helps to keep down the codling moth.

WINTER APPLES.

OLD MISSION, Jan. 5th, 1874.

The club met at 6½ P. M., Mr. J. E. Savage in the chair.

Mr. Reynolds.—I would ask what is the cause of scab spots on apples. Although we are comparatively free from them here, I would like to know in what they originate.

Mr. Avery.—I would not attempt to fully answer this question; but my observations lead me to believe that they are due to bad cultivation, climatic influence, and overbearing. My Snow apples were affected by scab last year, but I believe they would have escaped it had I thinned them out one-half. Apples grown on young trees are less liable to this defect than those grown on older ones.

Mr. B. Montague.—Why was it that my Snow apples grown on young trees

under good cultivation were affected by scab, when my neighbor's, grown on older trees that had received little or no cultivation, were perfectly free from it?

Mr. Parmelee.—Was the ground rich where your trees were?

Mr. B. Montague.—Not remarkably so. My observation leads me to believe that there exists an inherent pre-disposition to scab in certain varieties of apples, which no treatment will overcome. Russets are generally free from it. My Greenings were also smooth last year. Some other varieties were scabby.

Mr. Parmelee.—There are two phenomena in apples which are often confounded. The "scab," resembling that mossy formation apparent on rocks, and a discoloration, beginning in a cloudy appearance of the surface,—the latter particularly noticeable on apples grown in the interior. I will not undertake to assign any cause for these phenomena, but suppose them due to some climatic influence, creating spasmodic growth in the tree,—the same influence which causes rust on wheat. I have remarked that in seasons when the temperature is uniform we find little or no scab, but when on the contrary the season is variable, producing sudden rises and falls of temperature, and causing spasmodic growth of the trees, it is abundant. The same is noticeable in spring wheat. Extreme heat produces rust; and I have noticed that where leaf blight is found it will be observed that the growth of the tree has been checked. I will say that I have never found leaf blight on Golden Russet trees.

Mr. Porter.—My Snow apple and Winter Pippin have been affected with scab the last three or four years. I believe this discoloration is caused by "honey-dew," from the fact that apples on which it is found are most frequently spotted on the upper side.

Mr. P. Tracy.—I would ask Mr. Porter what produces "honey-dew."

Mr. A. Montague.—Prof. Walsh states that "honey-dew" is an exudation from the aphid or plant louse.

Mr. Parmelee.—In speaking of winter apples I have not mentioned varieties. It would, perhaps, be well for us to consider which is the best variety for us to plant. We do not want a second or third class apple such as half the varieties grown; there is not as much profit in them as we should realize. We want a first-class apple, possessing most of the qualities which go to constitute a perfect winter apple. I would like to hear the experience of others with regard to the excellencies of different varieties.

Mr. Ladd.—The Spitzenburg requires a heavy clay soil.

Mr. B. Montague.—For a cooking apple I consider Greening No. 1, Baldwin No. 2. The latter begins to rot from the core in April, and is consequently not the apple for our late market. Russets are good keepers, but their want of color is against them. The Wagener is a good eating apple from January to August. Tree grows small and bears early and heavily. Red Canada is another apple that is a good keeper and bearer.

Mr. Parmelee.—With regard to winter apples, we must not merely consider which is the most profitable for ten years, nor must we too hastily reject a good apple because it does not sell readily here from want of color. We must look beyond that period of time, and our local market. If we can raise a high flavored apple, good for culinary and eating purposes, it will sell in foreign markets without regard to color. If we can rank our Golden Russets with Newtown Pippins we can't do wrong to run on it. Grimes' Golden Pippin has been mentioned as the best quality of apple. I have some in bearing, and although I do not attach much value to the recommendations of nurserymen,

I must concede that in this instance the flavor has not been over-estimated. It appears to be a good grower and bears well for its age. If it proves to possess other good qualities needed in a winter apple, I shall feel safe with this variety for shipping to foreign markets, although not beautiful. Large apples are not especially desirable, particularly for dessert purposes. The Spitzenburg is a variety much sought after. It is not plentiful, and owing to its being a moderate bearer it is not largely planted in commercial orchards. I have known it to be productive where the soil was highly cultivated. Cultivation has much to do with increasing the productiveness of apple trees. I had an instance on my farm in illustration of this fact. Some old Indian apple trees which had not borne for three years produced good crops on the soil around them being broken up. The Greening is a valuable variety for culinary purposes, but its bearing is against it. New apples have been produced and puffed, but the leading varieties of eighty years ago are the standards of today. While I am absent at New York I will endeavor to see Mr. Downing and learn something from him that will be useful to us in choosing our winter apple. We want a long-keeping, good quality, red apple for the South. The Roxbury Russet may be found a valuable apple here. It is a better keeper and larger than the Golden Russet; on old trees it sometimes grows as large as the Greening. The Tallman Sweet is an old variety, which is productive and considered a good-keeping apple with us; but local reputation is not a safe rule for us, for while sweet apples are in greatest demand in the country, sour ones are most highly esteemed in cities.

Mr. Montague.—What is the reputation of Grimes' Golden Pippin as a keeper?

Mr. Parmelee.—Downing says from January to March.

Mr. Montague.—Yellow Belmont is a good cooking and eating apple, and a good, annual bearer; although generally not a long keeper, if grown here might keep well.

Mr. Reynolds.—I have some Belmonts now in perfection. Their flavor is delicious; put owing to their delicacy they cannot be carried to market.

Mr. Grey.—The Belmont is excellent for cooking and eating. It is not a long keeper. The core rot begins in it as soon as it ripens.

Mr. Curtis.—We want an apple that will not fail us on any account. A year ago I thought we had such an one in the Greening; but last year I lost half my Greening trees. If I were sure that the trees of this variety were sufficiently hardy to withstand our climate under all circumstances, I would plant all Greenings. In selecting our winter apple we must consider hardiness. Have we a stock upon which we can rely for this quality? The Golden Russet has not failed us thus far. If this variety will infallibly resist our winters, why not use it generally as stock, and top-graft on to it any variety which we may ultimately select as the best to grow?

WEEDS.

OLD MISSION, Jan. 26, 1874.

Club met pursuant to adjournment. President Savage in the chair. Minutes read and approved. A. P. Gray, Esq., then read the following essay on "Weeds and the best methods of destroying them."

MR. PRESIDENT, LADIES AND GENTLEMEN:—Two hundred and fourteen of our weeds have, according to the authorities, been introduced from foreign countries, chiefly from England. In 1672 a book entitled "New England Rarities" gave a list of twenty-two plants, which the author spoke of as having sprung up since the English took possession. Among these the plantain, or "White man's foot," is mentioned. In 1758 the toad flax, also then known as the "Rausted weed," from the name of the gentleman who introduced it into Pennsylvania as a garden flower, had overrun the pastures of that province, and had caused many anathemas by the farmers against the unlucky intruder. In 1837 only 137 foreign weeds were enumerated in our catalogues.

The common chickweed is said to have been first sown in South Carolina as food for canary birds, and the presence of the Scotch thistle is accounted for as due to the *amor patriæ* of an enthusiast Highlander, who brought it hither as an emblem of the pugnacity of his countrymen. Another record says we have the thistle through the carelessness of a clergyman, who brought hither a bed of thistle down, and on changing it for feathers spread it and the seeds it contained broadcast over the country.

The Canada thistle is probably the worst of all weeds, as being more tenacious of life and more troublesome among crops than any other. Fancy yourselves binding sheaves about equally divided between grain and thistles. I have frequently heard farmers affirm that it could not be eradicated; that when their farms became infested with them they must either cultivate their crops among the thistles, or sell out and seek another location; but it is certainly true, that a vegetable cannot live without a top, any better than any animal can without a pair of lungs, as the leaves of the former correspond to the lungs of the latter. Consequently, if the top be prevented from growing, the plant must die.

I once knew a patch of thistles which were eradicated by the following treatment, viz.: the patch was converted into a sheep pasture, and the sheep were salted on the roots of the plants after removing the tops, salt being applied as often as the sheep required it, they ate the salt and considerable of the root.

If a farmer were asked, What is the use of weeds? he might make out quite a list of their benefits, among which might be some of the following: They shade tender plants, and in a measure serve as a mulch to the ground. Some weeds, by their offensive odor, drive away many insects. They may serve as a green crop to be plowed into the soil and increase its organic matter.

They make us stir the soil, and thus increase its fertility, and this is a strong argument in their favor, as many farmers would cultivate their crops very little if the weeds did not oblige them to do it; indeed, they regulate the amount of cultivation that most of our crops receive. Still, while thinking out the excuses for weeds, he would see other and more urgent reasons why they should not be allowed to grow.

They occupy the soil to the disadvantage of crops. They exclude light and heat from cultivated plants, which interferes with their growth. They take up mineral and other matter from the soil, and hold them during the growing season, thus depriving crops of their use.

It is not necessary to argue the injury done by weeds. Every farmer is well convinced that they should be destroyed, and the best means of accomplishing this is of the greatest importance. In the first place we should protect ourselves against their increase. This may be done by decomposing all manures

in compost, whereby the seeds contained will be killed by the heat of fermentation; by hoeing, or otherwise destroying growing weeds before they mature their seeds; by inducing all the weeds to grow we can from seeds already in the ground, and then kill them, if possible while in the seed leaf, as one man will destroy more weeds than half a dozen will, after they have become large enough to materially injure crops. The destruction of weeds is always in order. Let none go to seed in fence corners, in pastures, or on the sides of the road, or around stone heaps or other waste places. We must conquer weeds, or they will conquer us.

Mr. Pratt.—I never saw the milk weed thrive as it does here. It seems to be different from that found south. North of here, among the Indians, it is rare, though the soil is similar and there is quite as much neglect. So far as I know, it is more abundant here than elsewhere. I have some hopes that it will be exterminated, for if it is to be used as a substitute for rubber and therefore become valuable, it will disappear; at least this is Beecher's theory. Has any one seen the honey bee on the flower of this weed? The blow has a large amount of sweet matter, and is said to make superior honey.

Mr. Drew.—The common bees sometimes get it on their feet, but they can't work the comb, and so avoid it.

Mr. Porter.—On the Huron shore I have seen them at work on a small patch. They grew in the sand, and very strong. They were able to keep the superabundant honey-making matter down.

Mr. Curtis.—No subject is of more importance than the present one. The annuals are not very formidable, may be, and are destroyed; but the other, with powerful roots, propagating from roots and seeds both, are a different thing. The Canada thistle, for instance, should be persistently fought. In some parts of the country they seem to have given up all hopes of subduing it. To contemplate the future of this peninsula covered with thistles is fearful. I know that they can be killed. Even the largest patch may be destroyed in one year. Mr. Gray shows how to destroy them: cut their heads off—destroy their lungs. In Illinois, in as forbidding a spot as you can find anywhere, they grew and held the mastery. The ground was cleared, thoroughly plowed, and planted to potatoes, hoed often, and not one showed his head the year after. Never allow a green leaf to form on them and you can kill them effectually, perhaps easily as any other weed. It is often introduced in grass seed, and then spreads rapidly. If there is not private enterprise enough to attack them, we ought to tax ourselves and have it done. Milk weeds make no headway on my farm. I pull them out by the roots. The terror of New York dairymen is the ox-eye daisy. It is harder to get rid of than the thistle, because it spreads from the seed rapidly. It is here. Really, I am more afraid of it and the thistle than of the curculio. As to the other weeds,—pig weed and the like,—they are really no special detriment. They make us work our crops, perhaps, but are really not much in the way; but these terrors to saints and sinners ought to be attended to promptly. If there is any law on this subject it ought to be enforced with vigor. The more I think of the subject the more important it seems to me.

Mr. Pratt.—Perhaps the fact that down in Ohio where Mr. Curtis came from they grow the Canada thistle, and not much else, makes him so solicitous on the subject; but seriously there seems to be no more trouble in exterminating them than any other weed. Cutting off the tops at a certain time of the year will destroy them. The white daisy will, I am told, ruin meadows. I am more afraid of them than of thistles.

Mr. Ladd.—Where I came from the daisy was abundant, but where farming is well done they are not troublesome. They may be all about you and yet your own farm free from them. I once sowed daisy in grass seed, but dug them up and none have appeared since. As to milk weed, if the land is thoroughly cultivated they may be exterminated in one year. I killed the thistle on Mr. Paige's land by cutting off the stalk a little below the surface and applying salt, and have never seen a thistle since.

Mr. B. Montague.—They can be killed where you can cultivate, but they will thrive in meadows and pastures. I have seen them killed in meadows when cut at the proper time, say when the stalk is hollow; if rain follows the water reaches the root and destroys it. The thistles on Mr. Golden's came from New York in grass seed. Inside of his fence he has retarded the growth, but those in the road have not been disturbed for some time. The law requires the pathmaster to attend to them, even on another's farm, and charge him for the labor. The white daisy will propagate from eyes, but more rapidly from seeds. It will run out the grass in meadows. If allowed to grow in any rough place it will soon spread over the farm. Cattle and birds spread it. You must dig it out by the roots. In New York in sections one-fourth the hay is white daisy. If the patch of daisy on the Rushmore place were in New York it would spread over the whole farm. Johnswort is also a bad weed, but not equal to the daisy.

Mr. Pratt.—It has been intimated here, that if it were not for the weeds we wouldn't half work, wouldn't begin to raise so many potatoes. Now I don't like such an idea to go abroad. It is a reflection on our industrious habits, and I have half a mind to move to expunge all that sort of talk from the report; but as the enterprise and industry of Peninsula farmers is well known, it can do no harm. Two or three years of good cultivation will exterminate Johnswort even if it covers the whole ground, at least on our soil.

Mr. Gray.—I wish to explain. Generally we say the "weeds are getting the start;" and so we go to work among our crops. Farmers are busy men, and perhaps but for the weeds some crops would be neglected.

Mr. Archer.—When a small patch of Canada thistles is at stake, the best way to get rid of the same would be to pull them up. Each stalk pulled up pulls out an eye from the main root. Thoroughly attended to for one season will go a great way towards exterminating the same. A small boy, at no great expense, with something in the way of a glove to shield his hand, will do the work.

Mr. Tracy.—I am not very familiar with the thistle; but the witch grass, quite similar to the wheat plant, is one of the very worst weeds, especially in clay soil, though it will grow in sandy soil. I have taken a root of this plant and exposed it for a month to the hot sun, but when placed in the ground it grew again. A well known nurseryman set grafts on a piece of ground not used for thirty years, but allowed to remain in grass. He set twenty-five acres of grafts, but the witch grass came up and they were obliged to plow up the whole nursery, and cultivate the ground for a year or two. We get trees from that section, and must be careful. It is more persistent of life than the thistle. We can keep that down by cutting off the tops; not so with the witch grass: the roots will live for years. They must be dug up, the whole of them, and destroyed. In England they use very heavy tools to work among them. The radical leaves make coarse hay, but it is comparatively valueless. If it is anything like as difficult to eradicate here as elsewhere, we must be on our guard.

Mr. Ladd.—It is the same as quack grass, or devil's grass: has various names. In New York it was the worst weed we had. Never knew it to be exterminated, but it can be kept down by cultivation.

Mr. Tracy.—Western New York is thoroughly infested with it. As it may creep in here and not be recognized, I will at the next meeting draw an illustration of it.

Mr. Lawrence.—The seed is much like chess: only two rows of seed on the head, which is long.

Mr. Reese.—It is worse to plow in than the strongest June grass. In England it is called Cooch grass, in Wales the Devil's Own grass. I have dug up the roots, looking carefully for the small fibres, and even sifting the soil so as to remove every particle, but the next year it came up again.

MARKETS FOR APPLES.

OLD MISSION, Feb. 2, 1874.

The club met at half past 6 p. m., the President, J. E. Savage, in the chair.

After the reading and adoption of the minutes of the last meeting, the secretary, Mr. McCallum, read the following letter from Mr. W. H. Gardner, of Chicago:

DEAR SIR,—I read the account of your meeting at which was discussed the question of "Crops." This is a vital question to all engaged in earth culture, and one on which I, perhaps, should remain silent. But I was greatly interested in the article, and as I have my own opinions I will give them, warning you not take them for more than they are worth.

It looks to me as if the potato crop, at present, is the best which you can grow. I have inquired for some years regarding your soil and have always been told that it is good,—better than average,—for potatoes. Now for a market you have the lake region from Chicago to Buffalo. The Chicago market alone in ordinary years will take from you, at good prices, 500,000 bushels. The potato has sold here for from 75 cents to \$1.50 for years. The wholesale price now is \$1.15. The potatoes sold here are inferior, too, at this rate. You can get few baking potatoes. The potato grower should not confine himself to one variety. Good potatoes for baking, boiling, etc., should be grown. Now I drop the potato for the apple. If your peninsula had as many good bearing apple trees as it has trees of other kinds (beech and maple) it would find a ready market for every bushel of good winter apples like the Russet, the Baldwin, etc. The market for winter apples is constantly extending, while the belt producing them profitably is gradually narrowing. So you can, if you have a good climate for apples, plant by the section and have no fear for a market. You are in God's paradise for a market if you can get the merchandise demanded by the market.

HOW TO MANURE.

OLD MISSION, Feb. 9, 1874.

Pursuant to motion of adjournment, the club met at 6.30 o'clock P. M. The president, Mr. Savage, in the chair.

Subject for discussion: "How shall we keep up the fertility of our farms?"

Mr. Avery opened the discussion of the evening as follows:

We find the woody fibre of plants and trees composed principally of carbon, hydrogen, and oxygen. It is a singular fact that in this woody fibre hydrogen and oxygen are present in just the proportions of water, so when decomposition takes place the result is to produce water. Starch and sugar are composed of carbon, hydrogen, and oxygen. It is agreed by scientists that plants absorb both carbonic acid and water through the leaves. Thus you see how plants can make their bodies, as the supply of food is abundant. If now the oxygen of the carbonic acid be thrown off through the leaves, we have left only carbon and water, or carbon, hydrogen and oxygen. We have stated that plants get carbon, hydrogen and oxygen through the leaves. The next element to consider is nitrogen, which composes from 15 to 25 per cent of the grain of plants, the most valuable part, and from which we expect to realize returns for growing most of our crops. It is yet to be proven that plants derive any part of the nitrogen through their leaves; consequently they must take it through the roots. The chief source of supply is ammonia and nitric acid; but we do not find it in large supply in this shape, on account of its strong tendency to unite with other bodies, such as carbonic and sulphuric acid. Water will also absorb from five to six hundred times its own bulk of ammonia.

Now comes the point: Success or failure, profit or loss, on our ability to get this ammonia into the land and to keep it there when we get it. Lime has a strong tendency to drive off ammonia from its combination; also tends to produce decomposition; hence you understand why our soils show such quick returns from manures. Decomposition is rapid. From the above imperfect statement we may infer: cultivating or stirring the soil lets in the air to the particles of humus, and produces decomposition; that produces moisture (all known plants cannot grow without moisture); water attracts ammonia, and the roots drink up the ammonia. Admitting the fact that carbon is cheap, but nitrogen is dear, and that the available source of nitrogen is ammonia, which is very volatile, and that it escapes to the surrounding air whenever any substance is decomposing that contains it, how important it is that we study every available means to retain it!

I will point out what seems to me the cheapest means of preventing part of the loss:

First, Beware of long summer tilling during hot weather on barren fallows. This practice, I am glad to know, is at present disapproved by the best English farmers. If a great amount of tillage is necessary to destroy troublesome weeds, or the roots of troublesome grass, substitute hoed crops.

Second, Use large quantities of bedding for animals. Keep both animals and manure under cover until they can go where there are growing plants to welcome them. The fire-fanged, rain-drenched manure is hardly worth drawing on the land; besides it costs less to draw the manure as it is made to the field where it is wanted, than it does after it is saturated with rain-water. Nitrogenous manures are only available to plants in a soluble state; hence, after stable manure is thoroughly drenched with water, all that is at that time available is washed away, which is a very large per cent when we consider the urine as being the richest in ammonia. What farmer here to-night, if told by his wife on his return that his vinegar barrel was leaking, but would start immediately to attend to it? But, believe me when I tell you bushels of wheat

are leaking out of your manure pile every time it rains, but you take no note of it.

Third, Fatten as many full grown animals as your means will allow; purchase extra grain to feed if necessary, whenever the extra price of the fattened animal will pay the price of it; scatter a little gypsum on the stable floor every day; grow as much corn as your animals will consume before the 1st of February each year; sow alsike and mammoth clover wherever you sow wheat; cover the land with a thin coat of gypsum when the seed is sown to insure a good catch.

While on the subject of gypsum, I will make the suggestion that a great amount of ammonia is brought to the earth's surface with the snows of winter, would it not be well to sow gypsum, a small amount, to fix the ammonia until the time when the growing plants will take it? The price of plaster is high here compared with many places; consequently it will be economy to sow less and often, say fifty pounds per acre, and very evenly over the land. Gypsum is, perhaps, the only commercial manure we can at present afford to purchase. I believe every fifty pounds of gypsum sown on an acre of clover in early spring will increase the product of hay 500 pounds, and often much more. When we cease to let our hens and turkeys roost on the fence, stop the rain from our barn roof drenching our manure pile, supply our piggery with tight floors and roofs, and learn that all decomposition is a waste to the farm unless some plant or absorbent is on the spot to drink up the gases, then it may be time to talk of guanos and superphosphates. Somebody has said, manure your soil with brains. I will simply add, keep a correct book account of the result.

Mr. Tracy.—Experiments made by Dr. Kedzie at the State Agricultural College go to show clearly that a great amount of ammonia—the most difficult element of plant food to procure—is brought down by rain; and that the quantity of this alkali thus furnished us varies greatly in the different storms, some being richly imbued with nitrogen, while others contain scarcely any. Snow brings down more than rain, and the lighter the snow the greater amount of ammonia it contains. Hence the origin of the adage, "Snow is the poor man's manure." It may be that the remarkable fertility of our farms is due in a great measure to the unusually large quantity of snow which falls in the Grand Traverse region.

Mr. Drew.—There is no good farming unless we can leave the soil in as good condition after harvesting the crops as it was when they were sown. We must give and take with the soil. If our crops extract nourishment from the soil, we must replenish it with the nutritious elements extracted from it, otherwise future crops will suffer for want of food, and consequently diminish,—ultimately entirely fail. Old agriculturists fall back on barn-yard manure for this purpose. It is a question in my mind if beans are not preferable to clover for ploughing under. They are deep feeders and their root surface is very great, more in bulk than their tops.

Mr. B. Montague—This is a very important subject, and one which should not be lightly passed over. The soil here is different from that which I have been used to; it contains sufficient lime and other substances which go to make up the mineral part of soil, but is destitute of vegetable matter. Chiefly, I think, owing to the fact that in clearing the land, the aim seems to be to obtain what is termed a "good burn," that is to burn up everything combustible on the land, thereby consuming all vegetable matter and leaving nothing but sand and other incombustible substances. What we need to do

then is to restore to the soil a due proportion of vegetable matter. How is this object to be attained? In various ways. We must not confine ourselves to one method of doing it, but have recourse to all within our reach. We must manure freely. Should not depend on the droppings of our cattle alone to enable us to do this, but should collect leaves, rotten wood, muck, leaf mould, anything and everything indeed that will make manure, or tend to impart to the soil the elements lacking there. Second, we should aim at leaving our soil in as good condition after as before cropping. If this cannot be effected through the barn-yard, we must resort to plowing under green crops, such as clover; and the avoidance of such crops as are calculated to impoverish the soil.

Mr. Curtis.—These scientific speculations with regard to the chemical action of gypsum on clover, etc., are all very interesting, but I apprehend do not benefit us much at present. One practical suggestion, however, made by Mr. Avery,—that of putting gypsum in our stables and on our manure heaps, for the purpose of disinfecting and fixing the gases,—strikes me favorably. Since Adam was a gardener good crops have been obtained by manuring with barn-yard manure. Mr. Crozier went on to sandy soil and has converted it into a perfect garden by the free use of manure. I don't know why we may not make our soil productive in the same way. The question arises, what can we do that is practicable to effect this object? There are many ways of making manure. Barnyard manure is good, and the richer the fodder we feed to our cattle, the richer will be the manure they make. Clover is no doubt a good green crop to plow under for fertilization; but I think there is a possibility of making land clover-sick. I do not consider peas and beans as good for this purpose. Gypsum also is a good fertilizer. Clover together with barnyard manure and gypsum would surely bring our land into a high state of tilth. These are easily obtainable.

Mr. Tracy.—There are few farmers but would be glad to feed out large quantities of clover on their places, if they had the opportunity of doing so, in order to secure the manure. Many would even put up buildings and other conveniences to feed stock if they could make the cattle pay the expense of them, simply taking the manure as compensation for their trouble and expense incurred in providing the fodder. Now, clover gains nothing by its passage through the animals, and the total amount of plant food resulting from passing an acre of clover through animals cannot therefore be greater than existed in the clover in its green state. Again, it is known that the roots of a clover plant weigh much more than the top, or portion that is used for hay. If our clover is cut, dried and drawn to our barns, fed to animals, and then redrawn to the land, there must unavoidably be much waste, in addition to the loss sustained by leaving all the roots and a percentage of the top on the ground in such shape that they can be of little benefit to future crops. If in place of doing this we plow under the entire crop, root and branch, will not the saving of this waste of material and labor, and the securing of the roots while in a proper state for conversion into plant food, more than counterbalance the only advantage the plant in the condition of manure possesses over the green state? which is, that it is in a more suitable condition of being immediately taken up by the plant.

Mr. Avery.—It has been suggested that we use swamp muck as manure. I used it one year and derived little or no benefit from it.

AT THE AMERICAN INSTITUTE.

OLD MISSION, Feb. 16th, 1874.

The club met at 6½ P. M., the vice president, Mr. Marshall, in the chair.

The chairman called on Mr. Parmelee to favor the meeting with the incidents connected with his recent journey. That gentleman read the following report:

If I should give you an account of my visit to the American Institute Farmers' Club and not speak first of the good will manifested by officers and members to strangers visiting them, I should wrong them and my own feelings also. For a great many years they have kept up their meetings and have been a headquarters for farmers visiting the city. They are as far as possible from being a "secret" society, but no such society treats its members with more courtesy than that club does their brotherhood from abroad.

It had been a marvel to me that they kept so long the old figure head, "N. C. Ely, chairman," but I see through it now: they have no occasion to change. He is a man of to-day, and not a relic of the past. Their secretary is paid a salary of \$3,000 a year, which gives them a good man. Their plan is to have subjects introduced in written form, as much as possible, to promote brevity and to facilitate correct reports. The discussions following the papers are not fully reported, except when some important facts are brought out.

The prevailing notion that difference of products in various localities is attributable to varying soils, is so universal that I thought it a good time to illustrate, to some extent, the fact that climate is all important in attaining certain desirable results. A gentleman present referred to the report of a committee of the United States Pomological Society at their meeting in Boston, which set forth that iron in the soil was the cause of diversity in color; and he thought we must have plenty of iron in our soil. It was well met by a farmer from Orange county, who said if that was the case, they ought to raise very beautiful apples, as their soil was nearly all impregnated with it.

You are aware that the soils of this region, as well as the springs here, are almost wholly free from indications of iron; and like the Orange county man, I could refer to my old farm in the south part of this State, on which I had a bed of bog ore and most of the soil showed it plainly, but it did not produce those colors. As we, in Northern Michigan, are more nearly circled in by the great lakes and have, in addition, our numerous smaller inland waters, so we have somewhat less rainfall in summer, and more blue sky and powerful sunlight.

The freedom of our apples from worms was a matter of surprise, they are so accustomed to finding the moth in them; but to see specimens of Maiden's Blush, Alexander and Fall Pippin in perfect condition in the month of February, without extra care in keeping, and after being trundled over a thousand miles of rail, was evidently a new thing to all.

The fact that our winter apples go through to late spring or early summer, without loss or extra care, was almost forgotten in the interest manifested in the red cheeks of the Rhode Island Greenings, Roxbury Russets, Swaars and Fall Pippins, showing that men are still disposed to set beauty before utility.

Many questions were asked as to our climate and productions, and in the informal discussion apple production in the eastern States was discouragingly spoken of on account of insect enemies. Dr. Trimble, of New Jersey, who is

a practical entomologist, said, "Tell your people to quit lumbering and go to planting fruit trees, and then take care of the insects."

I found in the library of the American Institute an excellent treatise by him on curculio and codling moth.

The question of best late keeping red apple for us to plant, I could not find two men to agree upon. The Hubbardston Nonsuch is very popular at the east among growers and dealers. Its season there is November to January: whether it will keep here until May or June can only be determined by trial. The Northern Spy, as a family apple, stands very high everywhere I went. It did not withstand the railroad jarring on my trip any better than the Fall Pippin, and but little better than the Belmont. With our water facilities for transportation that may be no very great objection. The Baldwin, Roxbury and Golden Russets, and Spitzenburg, stood carriage best; the Greening stood well except some of the riper specimens.

I could get no name for the apple called here—for want of a true name—Flushing Spitzenburg, nor for the apple called here Cogswell, Calvert, Melon, etc.

Mr. Downing seems to regard the Beurre d'Anjou as the best pear for general cultivation; thinks the Beurre Clairgeau too variable, excellent when it does well, but risky; would advise planting Clapp's Favorite for an early pear, both on account of quality and productiveness; says planters there are paying more attention to pears now than to apples. He thought that Tewksbury Winter Blush apple might be valuable to us to send long distances in the spring, if it proves to be adapted to our locality. It is cultivated in some parts of Pennsylvania.

Mr. Ellwanger, of Rochester, thought we would not like it. They have dropped the cultivation of it.

Trees or scions can be had of Hooper, Brother & Thomas, West Chester, Chester county, Penn. Though quite small it is handsome, and is "said to have more juice and flavor than any other long-keeping variety."

Every man who owns a copy of "Fruits and Fruit trees of America," will be glad to hear that the author, though seventy-two years old, is full of life mentally, and is almost as good as new bodily; not living, as he said, on borrowed capital, but on a good constitution, strengthened by use and insured against accident by temperance in all things.

CLOVER AND MR. GEORGE GEDDES.

OLD MISSION, Feb. 11, 1874.

Mr. Curtis opened the discussion of the evening with the following address
How can we make our land productive?

To answer this question we should well consider the peculiarities of our soil. Ours may, and I think does, need what others do not. The alluvial, or valley soils of most countries, also the western prairie soils, are rich in decayed vegetable matter—"humus," I believe it is called. In general terms such soils are very productive. If in great excess they only produce such crops as are rank feeders, such as corn and hemp. Other grains run to straw. When the amount is moderate they grow all kinds of crops well. The addition of vege-

table matter to such soils would not only be useless, but might be absolutely detrimental.

But *humus* incorporated with stiff clay soils, makes them friable, and gives them that tilth so necessary for growing crops. It would be difficult to get too much into such soils: their mechanical structure would be improved in about the ratio they were made to contain this valuable ingredient.

Our soil is neither a stiff clay nor a vegetable loam. It is what I suppose would generally be called a loose calcareous drift, and contains an abundance of the mineral elements generally thought necessary for plant food. It does not, like clay soils, need *humus* to improve its mechanical structure. It is friable enough without any such help. Then does it need vegetable matter at all? I think it does. The more the better. I am of the opinion that could we get as much into it as the prairie soils contain, we would have, practically, the best soil in the world. I further believe that it is perfectly practicable to secure a sufficient amount at moderate cost, indeed at no cost. Yes, I think we can get it for nothing, and "something thrown into the bargain."

How is this to be obtained on such terms? I last week came across an article by the Hon. George Geddes, so exactly in point that I copy a large portion of it. It is an answer to an Iowa farmer, whose land had been rented and run down. He says:

"Had a proper system been carried out on this farm, the manure it wanted, not merely to keep it good, but to make it grow better, would have been produced in the form of clover and other forage crops. Clover turned under when the proper time has come, in a judicious rotation, *is manure that costs nothing*, and where a man begins in time to take care of his land by the use of clover, and having a proper proportion of live stock on his farm, he can do better than to go a mile for "coarse" manure, even when it is given to him.

THE CLOVER CURE.

"Sow clover liberally—say one-fourth of a bushel of seed to the acre, when the wheat crop is small. After the wheat is harvested, put a bushel of gypsum (plaster) on the acre. The next year plaster or cut for hay; the third year pasture or mow once, and, when the time has come to sow winter wheat, if desired, it will do to plow under all the clover the furrows will hold, and sow the wheat, or let the sod thus turned over remain till early spring; then sow seed on it. Timothy seed with the clover seed, say four to six quarts to the acre, is very desirable where the land is to remain in grass two or more years. The timothy helps cover the land, and adds much to the value of the hay crop, as well as to that of the pasture. Where winter wheat is raised, it is my rule to sow with the wheat the timothy seed, and the next spring sow the clover seed. The value of the sod—that is, the roots and a stubble just mown of clover two years old, that had timothy, as described, mixed with it—is greater than any ordinary dressing of "coarse" yard manure.

IS THIS SO?

"Prof. Kedzie, one of the most careful experimenters among scientific men, professor of chemistry at the Michigan Agricultural College, 'took a square foot (of which there are 43,560 in an acre) of heavy June grass turf, and washed away all the soil in running water, and then weighed the grass roots and surface grass, or the amount of green manurial matter usually contained in a heavy greensward, and found it to be five pounds to the square foot, or at the

rate of more than 100 tons to the acre.' The professor, in his letter to me, from which the foregoing has been extracted, further remarks that 'this is doubtless in excess of ordinary greensward, as it was a very heavy mat of June grass;' but he says he 'thinks that few farmers estimate correctly the amount of vegetable matter they add to their soil by plowing under heavy greensward.' One hundred tons to the acre of clean grass and roots from the turf of an old pasture or lawn, is a very valuable manuring, when we consider how evenly it is spread and accurately it is applied. But the roots of June grass run but a little way into the ground compared with the roots of red clover, that penetrate from two to four feet, and bring to the surface the fertility that lies deep in the soil. When a clover sod, that after being mown has been allowed to stand a few weeks, and the new stalks are grown to be perhaps eight or ten inches high, there will be about all that can be plowed into the furrow.

MANURE THAT COSTS NOTHING.

"I have said such manuring costs nothing. Let us make an account, and charge on one side the seed of the clover and timothy, and the bushel of plaster, and the cost of sowing; and credit on the other side the fall feed, after the wheat crop has come off, and the crop of hay that may be cut next year, and, if desired, the second crop to be cut for seed; the next year's pasture or crop of hay that can be had long before it is time to do the one plowing for the crop of winter wheat, and allow the stalks to again start up until it is time to prepare for the wheat. Let all these things be credited to the clover, and out of their value be taken the items of cost before stated, and a large compensation for the use of the land will be left, and the land vastly improved, and the successive wheat crops will be larger and larger as the process is repeated. "All flesh is grass;" at any rate all successful farming is founded on grass, using that term in its common acceptation, as covering the clovers and like forage plants. Wherever red clover can be made to grow well without manuring, there is no difficulty in sustaining the fertility of the soil without going off the farm for manures, except plaster.

THE POTENCY OF PLASTER.

"I except plaster, for it has been shown that at the Michigan Agricultural College a single bushel of plaster added a full ton of hay to the yield of an acre of ground in the five, most of it in the four mowings that followed—two crops being taken off the ground each of the two years succeeding the sowing of the plaster. The cost of a bushel of plaster is but little in most of our country, and if a bushel is worth a ton of hay above the ground, the roots below must be proportionately benefited. So I believe in buying and using plaster on clover, oats, barley, and corn, and even old pastures. But plaster is the only manure that farmers generally can afford to buy and bring on their farms, if they did but begin and continue in a wise course of green manuring while their land was still good. It is very easy to work a horse and keep him fat, but to work him and at the same time bring him up from a condition of emaciation is hard work. If the owners of the excellent soils of Iowa and other new States would but consider this, and while their land is yet at its best estate turn their attention to green manuring and stock feeding of all their forage and much of their corn to animals, and sell less wheat and more wool and meat, they would get better prices for their wheat, and in the long run more bushels to the acre; but they would sow less acres."

All may not know Mr. Geddes. All who do, know him to be a practical and successful farmer of ripe age and experience. No better authority can be cited. I assume that the fullest reliance can be placed in his statements. If so, we have only to ask: Can we grow clover here? We know it can be done; and probably as successfully as in any region with which Mr. Geddes is acquainted. I therefore invite the most careful attention to his statements. Carefully ponder this fact, viz: There is one hundred tons of green vegetable matter in a heavy June grass sod, and more in a clover sod. *One hundred tons!* This is secured in two years from the time of sowing. Meantime, two crops of hay can be taken off besides. These offset against the cost of seed and plaster, and use of land, which, as Mr. Geddes shows, amounts to much the largest sum. And so we get the one hundred tons of manure for nothing, and money into the bargain.

I have said the more vegetable matter we can get into our soil the better. Why? Not to make it loose. We have little but what is already loose enough. We may probably go the world over and hardly find another so nearly *just right* in this particular, as it came from the hand of nature. Then what the food of humus? Simply to make it rich,—productive,—grow larger crops. I say this from a common-sense standpoint. We all do know that our land, *practically*, is productive or barren just about in the proportion as it contains vegetable matter.

If it be said that it may be made to produce large crops by a sufficient amount of stirring, done often enough, and at the right times, I shall take no issue. I think much may be done in this way. Just how it is brought about I won't undertake to tell, for I frankly say I don't know. But I have a pretty thorough conviction that it will be here as in all other places, and hereafter as it has been heretofore, viz.: Those who work into their lands most green crops, and hardly anything else but clover, and those who most carefully husband all the "good old-fashioned barnyard manure" they can make, and most judiciously apply it, will grow the biggest crops and make the most money.

Mr. Parmelee.—I am glad this paper has been read. I consider Mr. Geddes one of the best agricultural writers in the United States, and hope every word of that report will be pondered on. Mr. Geddes is a practical writer. Mr. Ellwanger is of the same opinion with regard to all manufactured manure. I believe we read too much and have too many theories on this subject. I have always sown fifteen pounds of clover seed to the acre, as recommended by Mr. Geddes, with good results. I have often said that the manure I haul from my yard is not worth the drawing.

Mr. Avery.—With regard to plaster, my experience teaches me that as much advantage is derived from half a bushel as from three bushels to the acre. I have received a letter from Grand Rapids containing an offer to supply us with plaster, by the car load, at twelve shillings per barrel of 320 pounds, delivered at Traverse City. The lowest prices at which we have been able to buy it heretofore were \$2.25 at the city and \$2.50 here.

Mr. Tracy.—The remark of Mr. Geddes that it is easy to work a horse and keep him fat, etc., may be applied to our soil; for, notwithstanding the great loss of vegetable matter it sustains in the burning, during the process of clearing, it still is comparatively rich when we begin to crop; and if due care is taken in working the soil, giving it back something in exchange for the nourishment supplied to our crops, it may be "worked and kept fat;" but cases where this is not done are unfortunately of too frequent occurrence. I think

burning as generally practiced at present is very injurious to the soil, and should be discontinued. The method adopted by Mr. — in clearing is, in my opinion, much better, and I believe in a great measure accounts for his having better than average crops. He collects the hewn timber into heaps, gathering together even the small branches, confining the burning to the smallest possible area.

Mr. A. Montague.—With me the application of plaster to clover has resulted well. In my experience with it I have found that old plaster is as beneficial as fresh. Have not found it benefit corn. Have used ashes on corn, clover, wheat, and under my orchard trees without any perceptible effect.

Mr. B. Montague.—From my experience with plaster I am convinced of its efficacy in increasing yield of clover crops, even when sown on old pastures. I believe it the best thing to keep our soil in good condition. I have used ashes on clay soil to good advantage, but have sown them here without any marked effect. It would be well for us to experiment as my brother has done. We may thus learn much with regard to these manures which would prove useful to us.

Mr. Avery.—Where land is cheap it may be more profitable to turn in green crops than to draw manure; but where land is high I believe it pays to manure.

Mr. Parmelee.—No doubt Mr. Avery has improved his farm by manuring. The point Mr. Geddes makes is, that it is cheaper to fertilize by turning under green crops than to make and draw manure for that purpose. This is the same statement which I have made. I would not draw manure out of my yard were it not in my way. With regard to ashes and plaster I will say that I have used leached ashes with plaster, and was well pleased with the result. Plaster would possibly have done as well alone.

Mr. Ladd.—Where I have applied plaster to timothy it has had no perceptible effect; but where used on mixed crop of clover and timothy *both* have been benefited; the crop from that part of the field which was plastered was double that harvested from the part which was not plastered. I have applied plaster to corn (a handful to the hill) without any marked result. Ashes so used have increased the yield of corn. Like Mr. Montague I have found old plaster as good as new.

Mr. Tracy.—In my experiments at the Agricultural College, I found that leached ashes used on the bare ground proved better than either plaster, or salt and plaster. Corn was not perceptibly benefited by plaster, but was markedly increased by the application of muck and salt. If we grow clover in our orchards, how are we going to protect our young orchards from grasshoppers?

Mr. Pratt.—I have tried plaster on corn, but have found no benefit from it.

THREE QUESTIONS AND ANSWERS.

OLD MISSION, Feb. 23, 1874.

The club met at the usual hour, President Savage in the chair.

The secretary read the following paper, handed in by Mr. Parmelee:

FIRST QUESTION—Can we manure young orchards too much?

ANSWER—Yes. No man can afford to plant an orchard and then let it alone until it is ready to bear, any more than he can afford to plant a field of corn and not go near it again till ripe. There are two ways to encourage the growth: one by plowing or cultivating, the other by manuring. Cultivation you can stop as early in the season as you please; and if the ground is not very rich the growth will soon stop preparatory to winter; but in case of heavy manuring, a warm fall with rains will be likely to keep up growth too late to allow proper ripening of wood before winter, and the risk is greater, if manuring and cultivation are combined. The question of hardiness is simply that of proper ripeness, and that is attained by a seasonable stoppage of growth, and prevention of subsequent activity. Where manuring is heavy, your trees are more subject to the caprice of the seasons; but if you encourage growth mainly by cultivation, the process of fall ripening of wood is much more under your control?

SECOND QUESTION—How can we best utilize hen-house manure?

ANSWER—I would say, Make as fine as practicable, and apply on the garden, mixing it in the surface soil about as deep as will make it a connecting substance between the capillary moisture of the ground and the air.

THIRD QUESTION—Is it equally beneficial to the land to harvest clover and turn the sod, as it is to turn under the whole crop, root and branch?

ANSWER—I cannot answer this very confidently. Our general ideas of green manuring would lead us to say, "No! the more we can turn under the better." But I am aware that the experiments on record tend to prove the contrary,—that more wheat is grown where the clover is taken off before plowing; and I have seen some results that lead me to think the same way. If the facts are as the experiments seem to prove, they are as much against the popular notion as they are against theory from the standpoint of chemical analysis. The value of the hay to be saved or turned under makes it an important question, and I would like to hear it discussed in the light of experience.

Mr. Gray.—I cannot speak from personal experience, but have read statements to the effect that clover is worth nearly as much as manure after being passed through animals as it is in its green state.

Mr. B. Montague.—I like Mr. Geddes' plan of harvesting one crop and turning under the second growth.

Mr. Parmelee.—I should like to hear Mr. Ladd's experience with clover.

Mr. Ladd.—I have had but little experience. Tried turning under second growth, amounting to about a ton to the acre, and had a good crop of wheat.

Mr. Marshall.—Mr. Brinkman harvested first crop from part of a field, and turned under the whole crop on the other part; could see no difference in succeeding crops. They were equally good on both portions of the field.

Mr. B. Montague.—I think it well to cut clover early, so as to have a good second growth to turn under in time for winter wheat.

Mr. Parmelee.—In Germany there are a great many experimental farms. There, the results of a long series of experiments are favorable to turning under the bare sods; indeed, the very best results are obtained by turning under after a *seed* crop is taken off. They also establish this additional fact,—that crops were not so satisfactory after sheep pasturage as by the first method. Possibly, the constant nibbling prevented the growth of the roots.

Mr. E. Wait.—I should not expect the best results from plowing under clover the *first* year. The year following and succeeding years get the benefit of it.

Mr. Montague.—Mr. Wait's idea is a very valuable one, especially where land

is wanting in vegetable matter. You thus obtain vegetable matter for future use.

Mr. Reese.—My plan is to plow about four inches the first time and six the second.

Mr. Parmelee.—Even on very sandy soil, if the season is wet, you can grow clover, and of course after that any crop. I have in mind a piece of that description which, from the depth of the sand was a terror to travelers, thus brought up to fertility.

Mr. Ladd.—It is possible, in the case of those German experiments to which Mr. Parmelee has alluded, there was already sufficient humus in the soil. If so, full results would not be obtained the first year or two.

Mr. Curtis.—I notice Mr. Geddes turns his sod just before he sows his seed. Here we may do that, but if his land is heavy I don't see how he prepares his seed-bed properly. On my light clover land I manured heavily with barn-yard manure, had a good stand of wheat in the fall, but it grew rank and winter killed.

Mr. E. Wait.—After manuring I plow shallow, that the wheat roots may have the benefit of the manure.

Mr. Parmelee.—Mr. Geddes, in a letter published about the year 1868, dissuades from summer-fallowing. I am inclined to favor Mr. Wait's idea of shallow plowing, if you can kill the sod. I have seen no good effects, at least not immediate good effects, from plowing in deeply either sod or manure.

Mr. E. Wait.—If you want a good first crop, don't plow deep.

Mr. Parmelee.—The New York club has been in a muddle for years over this question of deep and shallow plowing. I hope we shan't follow their example. The fact that sod land plowed shallow brings the best present crops, is nothing against deep plowing. On bare land deep stirring, thereby exposing the sub-soil to the air, is beneficial. And even on our well drained lands tile drainage would be good. Deep and shallow plowing, as applied to sod or bare land, are two very different things.

Mr. Savage.—Turning under long straw will have much the same effect as tile drainage. I have witnessed its good results in Wisconsin in an unusually dry season.

Mr. Parmelee.—I once knew a peach orchard situated on a sandy soil, but subject to overflow. The owner laid down a tile drain between the rows of trees. The next year the orchard did splendidly. The following spring the orchard was deluged as usual. On examination he found his drain full of fibrous roots. The tiles were removed and large ones of wood replaced them; but the next year these also were filled with fibrous roots,—filled as if they had been *rammed in*. Why should those fibrous roots grow there in such immense quantities? While absent I read your discussion on weeds; and as to Canada thistles, would say I have effectually destroyed them by cutting them down and applying salt.

Mr. Savage.—Dr. Mack, of Benzonia, says sulphuric acid, a drop or two only, will kill any weed.

Mr. B. Montague.—I learn there are more thistle patches.

Mr. W. Parmelee.—Applying kerosene to the aphids, I killed them and the twig they infested. Perhaps it will kill thistle.

Mr. Darius Drew.—I have heard that kerosene will kill the thistle effectually.

THE PROPER TIME TO SOW GRASS SEEDS.

OLD MISSION, March 2, 1874.

The club met at the usual hour. President Savage in the chair.

Subject for discussion: "The proper time to sow grass seeds, and with what crops?"

Mr. E. Wait being called on to give his experience in sowing grass seeds, said: By sowing clover with wheat in fall, the first week in September, and in spring not later than May 10th, I have invariably met with success. In the case of timothy the time of sowing is not so important. I sow eight quarts of clover seed, or four of clover and two of timothy to the acre. Timothy and clover sown together grow better than either one alone. My method of sowing is first to sow wheat, then drag the ground and sow the grass seeds. Clover sown with buckwheat by Mr. Kelly on September 1st resulted in a good crop; sown with wheat by him at the same time it did not succeed so well.

Mr. W. Parmelee.—Clover sown with wheat by my father resulted in a crop of five tons to the acre in two cuttings.

Mr. Gray.—I have met with success by sowing grass seeds with wheat early in September, with buckwheat early in July, and with oats early in May.

Mr. Savage.—Mr. Marshall and myself had good crops of clover by sowing it with buckwheat early in July.

Mr. Gray.—I think the failure in clover crops is often owing to light seeding. I sow fifteen pounds to the acre, or one bushel to four acres.

Mr. Drew.—Mr. Marshall sows wheat between 1st and 10th of September, and immediately after seeds to clover, with general success.

Mr. A. Wait.—I think there is little use sowing clover after 10th September.

Mr. Ira Porter.—Two years ago I sowed clover seed with winter wheat in October and had a good "catch." Sown with oats last year it failed.

Mr. Curtis.—Clover needs a large amount of moisture. If the sowing is followed by frequent falls of rain, a good "catch" will be obtained; if, on the contrary, drought succeeds the sowing, the crop will be light, or entirely fail. More depends on the quantity of rain which falls after the sowing than the time of sowing, and hence the advisability of sowing in fall, when rain is more prevalent than at other seasons.

Mr. Pratt.—I sowed clover with millet in May, and had the finest "catch" I ever saw, although no rain fell till the following July. Has it occurred to any present who have not succeeded with clover that the seed may have been defective? We import all our seed, and don't know how old it is. I believe our soil is naturally well adapted to the growth of clover and all kinds of grasses.

Mr. B. Montague.—I think failure in clover crops is often due to drought. Ordinarily if clover is sown in early part of September it gets considerable growth before hard frosts come, and does well. I do not know why it does not succeed if sown later, but it is so. I believe one cause of failure is light sowing; a bushel to four acres is, in my opinion, the right quantity to sow.

Mr. Savage.—I think rolling the ground after sowing clover beneficial. Mine, sown with buckwheat and rolled, resulted in a good "catch."

Mr. Drew.—In order to show how run-down land may be brought to a fertile state by grasses, I will cite the following instance: In 1825 in passing from

Albany to Utica by mail stage (which was the only conveyance at that date), I noticed that farms with fine buildings were vacant and falling into ruin on the plains in that region. On inquiring the cause of this I was informed that the soil was "run out" and would produce no crops. Later, a man from Great Britain bought one of these farms for a mere trifle, and by a judicious use of clover, so increased the fertility of the soil as to raise a magnificent crop of wheat. The consequence was that these abandoned farms were bought at high prices and are now producing excellent crops of all kinds.

THE BEST FLAVORED APPLES.

OLD MISSION, March 16, 1874.

The club met at the usual hour, President Savage in the chair, and Secretary McCallum at his desk.

Subject of discussion: The qualities and flavor of the different varieties of apples.

A committee, consisting of Messrs. Parmelee, Marshall, and Porter, was appointed for the purpose of classifying the apples brought in by members, and arranging them for exhibition. The said committee reported twenty varieties, viz.: Flushing Spitzenburg, Yellow Bellflower, Grimes' Golden Pippin, Swaar, Rhode Island Greening, King of Tompkins County, Ben Davis, Golden Russet, Roxbury Russet, Perry Russet, Baldwin, Belmont, Northern Spy, Lady Apple, Cayuga Redstreak, Wagener, Stone Apple, Rawle's Janet, Esopus Spitzenburg, Red Canada.

After the apples had been examined and tasted, a vote was taken in order to determine which was considered the best flavored apple, and resulted as follows: Golden Russet, 15; Esopus Spitzenburg, 7; Grimes' Golden, 4; Greening, 3; Wagener, 3; Belmont, 1; Lady Apple, 1.

Mr. Parmelee distributed scions of the "Tewksbury Winter Blush" to all members wishing to have them.

THE BEST APPLES FOR PROFIT AND FOR DESSERT.

OLD MISSION, March 23, 1874.

The club met at the usual hour, President Savage in the chair.

Subject for discussion: "Which are the best apples for us to grow for profit?"

The secretary read the following letter, forwarded to the club by Mr. O. E. Clark of Traverse City:

17 PORTLAND BLOCK, CHICAGO, }
February 13, 1874. }

Mr. O. E. Clark, Grand Traverse, Michigan:

DEAR BROTHER:—I called yesterday on Mr. H. P. Stanley of this city, who

is the largest dealer in apples here, as well as the oldest, his sales reaching nearly half a million dollars annually.

My object was to learn what sorts of winter apples he sold the most of, and that gave best satisfaction. He said he hardly wanted to see more than five varieties, and he named them as follows, the first named being the most valuable, and so on, viz: Rhode Island Greening, Esopus Spitzenburg, Baldwin, Northern Spy, Roxbury Russet. He remarked that in the fifteen years that he had been in the fruit trade here, he had tried several times to introduce other sorts, some of which are as good, or possibly better; but the above are so well known and so satisfactory that he would not care to raise any others.

Yours truly,

THOMAS LYMAN.

Mr. W. H. Adams, in a paper to the secretary, stated that his collated list of trees, sold this winter for the Grand Traverse nurseries, shows the varieties of apples most in public favor to be,—Wagener, Rhode Island Greening, and Golden Russet; and of pears, the Bartlett, Flemish Beauty, and Doyenne d'Ete.

In order to ascertain which was considered by the club to be the best dessert apple, each member was requested to name the three varieties which he esteemed most highly for this purpose. The result was:

	1st Choice.	2d Choice.	3d Choice.
Golden Russet.....	11	5	6
Grimes' Golden.....	3	3	9
Esopus Spitzenburg.....	5	7	2
Belmont.....	1	0	0
Swaar.....	1	0	1
Lady Apple.....	1	0	0
Roxbury Russet.....	1	1	0
Wagener.....	1	4	0
Rhode Island Greening.....	0	3	5
Northern Spy.....	0	1	0

Mr. Curtis.—I suggest that a resolution be passed to the effect that this club deems it unwise to grow the Esopus Spitzenburg for market in this region. I make this suggestion because I think it just as practicable to grow pine apples as the Esopus Spitzenburg to perfection here, and I should regret exceedingly should any vote of this club influence any person to grow this apple. I believe those apples of this variety exhibited at our last meeting were very inferior to those grown in other regions. Of a dozen trees which I have in my orchard, not one is fine and healthy, and only one has borne fruit, although they are nine or ten years old. The Golden Russet, on the contrary, grows to greater perfection than in any other region that I know of.

Mr. Porter.—I have some Esopus Spitzenburg trees the same age as those of Mr. Curtis, which have borne a few apples the last two years, and are as handsome and healthy as the trees of other varieties in the orchard, except the bark-splitting, to which they are subject.

Mr. E. Wait.—I have some trees of this variety which are as nice and healthy as any in my orchard. They are nine years old and have borne well the last two years.

Mr. Marshall.—I have one tree of the Esopus Spitzenburg twelve years old, which has borne but little.

Mr. Parmelee.—I admit that the Esopus Spitzenburg has the reputation of

being a bad bearer, but do not think it should be condemned on account of Mr. Curtis' experience. I have one tree which has borne full and well for five years. This is not a productive variety. Those of Mr. Parker are healthy; elsewhere in this region they have done well, and I believe that with good care they will succeed well here. Nevertheless, I agree with Mr. Curtis that nothing in favor of the growth of this apple for market should go out from this club.

Mr. Avery.—It appears that the Esopus Spitzenburg requires a strong, dry soil and warmth. They do best on the side of a hill sloping to the east, and will not bear well on sandy soil. I do not believe they will do well under the influence of the low temperature of this country. At this date my Baldwins are in the last stage of maturity, whereas my Golden Russets are deliciously crisp and juicy. I recommend planting Golden Russets largely, and if later we wish to change them, we can do so by top grafting. I would to-day as soon risk my last dollar in planting Golden Russets as invest it in any railroad stock, and should consider the former investment less speculative than the latter. The day is not far distant when this apple will command a higher price, instead of a dollar lower as at present, than any other apple in the market.

HOW TO HANDLE APPLES.

OLD MISSION, Nov. 7, 1874.

Monthly meeting of the club on the evening of this day. President Savage in the chair.

Mr. Avery.—One word as to pruning. I saw a very intelligent man who proposed to cut out the leader when his trees had attained the height say of eight feet. Here we practice a different system. I should like to ask Mr. Parmelee as to his experience on the subject.

Mr. Parmelee.—Have never been anything but an orchardist, and if I am well settled on any subject it is that we should always preserve a leader.

Mr. Tracy.—This tea-saucer system of pruning is derived from the English practice, where perhaps from their damp climate it may be the better way. American writers have copied from English authorities, and so the practice has grown up among us.

Mr. Parmelee.—I noticed fruit when in the south part of the State, and also at Traverse City, and I know how fruit has been handled. Now, when men are new in the business it is not to be expected they should know all about these things, but when I was in Traverse City I saw Northern Spies good enough to bring ten dollars per barrel next spring, really not as good as Indian apples. They were full of little dents and would not keep at all. This is not peculiar to this section. I have seen the same thing elsewhere and for years. If a man should handle his other crops in that way what would you say of him? Handle your apples like eggs,—yes, if eggs were worth five dollars each. Handle your apples as you would eggs at that price.

Mr. Barney.—I have had experience in handling apples and know that Mr. Parmelee tells the truth. Not one farmer in ten can be trusted to handle fruit. Have instructed farmers to pick carefully by hand and let the basket down into the barrel as far as possible, yet they would not do so. Once as I

got within forty rods of an orchard where I had bought fruit and given the proper instructions, I heard a big noise. On getting nearer I saw a man with a big tin pail pouring the apples from the top into the bottom of the barrel; another was pitching them as far as he could into a bushel basket. Some gather them carefully in baskets, take them by hand out of the baskets and put them carefully away. Even an ordinary apple handled in that way will keep and bring a large price in the spring.

Mr. Avery.—Many have an idea that apples sweat in the barrel, but this is a mistake. True, apples accumulate condensed moisture, but this is for much the same philosophical reason that drops of moisture collect on a glass of cold water brought into a warm room. If the atmosphere of the cellar is cooler than the exterior air apples will not "sweat."

Mr. Parmelee.—Don't pick in rainy weather, nor head them up on a very cold day. Apples should go into the cellar at about the temperature of the cellar.

Mr. Tracy.—Bright, mild weather is undoubtedly the best for this work.

Mr. Parmelee.—Apples picked in damp weather, or in the snow, and with leaves thrown in, won't keep. We can just as well get ten dollars per barrel for our best apples as not if we handle them properly. There should not be a dent in them. You can keep Snow apples and other tender skinned varieties very much longer by this treatment.

Mr. Drew.—Fruit should be gathered in October, but if you have an orchard of fifty acres, where are you to get help to pick them so carefully?

Mr. Ladd.—One half the apples gathered in this way are worth more than double the quantity gathered carelessly.

Club adjourned to Friday evening, November 27, when the annual election of officers takes place.

THE VALUE OF ROOT CROPS.

OLD MISSION, Dec. 7, 1874.

Club met on the evening of this day, the new president, Benj. Montague, presiding, and Mr. George L. Roberts at the secretary's table.

Mr. Marshall.—We don't appreciate the value of our soil and climate for roots. Two tons of hay and one hundred bushels of turnips are worth more than three tons of hay, with the additional advantage that animals thus fed require less water. I plow early and manure thoroughly, planting somewhat less than three feet between rows, and thinning out to about ten inches in the row. I grew this year on one acre 600 bushels of yellow ruta-bagas. The actual cost of this crop, including every item of expense, together with the interest on the land at \$40 per acre, is \$37 75, or about six and one-third cents per bushel. Its value at fifteen cents per bushel, \$90, leaving a clear profit of \$52 25 per acre.

Mr. Parmelee.—I have always had fine crops of ruta-bagas in dry seasons. After plowing the ground, have taken off one blade of shovel plow, run through with the other, planted my seed in this drill, and had a good yield. One crop put in this way, which we were unable to dig, went through the winter well.

Mr. Montague.—Sometimes that crop brings high prices and sometimes nothing.

Mr. Tracy.—Our plan for keeping turnips is this: A long ditch made with the plow, the roots thrown in, straw placed on top, and the ground thrown back on them. This was followed, I believe, with the spade. This was thought to be very fine for beets particularly, as they did not heat, and the convenience of getting at them is great.

Mr. Marshall.—I put 500 bushels together this fall. If I had not opened them early they might have spoiled. They were already heating, though they were by no means so securely covered as we cover potatoes.

Mr. Tracy.—Root cellars will heat with all the ventilation you are able to give if large quantities are put in together. I adopted an expedient this fall on which I will report next spring. It consists of a ventilator over the top, extending out at each end of the pit. The end may be closed in cold weather.

Mr. Drew.—One hundred bushels are enough to place in one pit. Throw straw lightly over them, and a little dirt; leave the ends open till cold weather, then close them, and on warm days open again for ventilation. Bruises on turnips will not make them heat, but earth mixed with them gathers dampness, which probably generates heat. Laing's purple tops are the best for us. They have no lateral roots, grow partly out of the ground, are sweet and not strong, and for the table cook as easily as potatoes.

Mr. Reese.—Roots invariably begin to rot when you cut off the top.

Mr. Tracy.—Possibly cutting below the bud occasions decay. Seedsmen claim that the best seed is grown from plants with a single shoot.

Mr. Parmelee.—I am a skeptic on improved varieties. I have seen Mr. Marshall's turnips, and my opinion is that mine, though not so thoroughly put in, are perhaps as fine as his.

Mr. Montague.—Of the same variety those sown in drills grow with necks and no bottoms; those sown broadcast were perfect and very fine.

Mr. Drew.—Some of our turnips weighed from ten to fifteen pounds; they were not pithy, but solid.

Mr. McCallum.—One of mine was enough for three meals, and very sweet and fine at that.

Mr. Tracy.—Cow horns are a good variety. They grow out of the ground.

Mr. Montague.—I have raised the Russia, a white sweet turnip, which fed to cows does not make the milk taste; but I would not recommend them for feed, as they bring up too much dirt.

Mr. Marshall.—There is nothing better for general use than the yellow rutabaga. I plant from the 15th to the 20th of June, earlier here than in the southern part of the State.

Mr. Tracy.—At Lansing the last of June or first of July will do. The nights there are warmer. Here our plants grow but little at night. I am now satisfied that the long orange carrot is the best variety for us. Their depth in the ground is no objection. The subsoil plow brings them out, cutting no roots, but throwing them out about as fast as a horse will walk.

Mr. B. Lardie.—The subsoil plow does the work effectually, and I am inclined to think it admirable, in order to ripen up the roots in the fall, to run the plow along one side of the row.

Mr. Tracy.—My subsoil plow came from Boston. Mr. Holdsworth of Traverse City is getting them up on an improved plan.

Mr. Montague.—I dig carrots by running a plow near the roots and then pulling them up. The subsoil is certainly a great improvement.

Mr. Drew.—Manure in the fall for turnips, plow it in, cultivate with gang plow in the spring, and never plant two successive crops on the same land.

Mr. Parmelee.—I have a curious piece of wheat, or rather what was wheat, for the wheat has disappeared. But I have seen no yellow leaves, nor have I noticed the Hessian fly. What is the matter I don't know: perhaps cut-worm.

Mr. Marshall.—The fly is here, but where they work the dead plant is always found.

Mr. Reese.—I sowed two and one-half acres of wheat early on peas and oat ground. It is pretty much eaten up. Scarcely any wheat or appearance of wheat left, but where there is any I find the Hessian fly. This wheat never covered the ground. Where the ground was well covered the fly has not done so much damage.

Mr. Tracy.—I have read that good root crops may be raised on clover sod turned down in the fall.

Mr. Marshall.—Such ground should be gang-plowed in the spring; the soil must be finely pulverized for turnips.

Mr. McCallum.—Will manure, put on the ground this fall one year ago and plowed in, but no crop planted, benefit crops the coming year?

Mr. Parmelee.—Experiments seem to demonstrate that manure placed on the surface does the most good, though I was educated in the opposite notion.

Mr. Marshall.—I prefer, if the manure is not too coarse, to place it on the surface and work in with gang plow in the spring.

Mr. Parmelee.—I mulched one row of trees with strong manure and another with straw, and if there is a difference, it is in favor of the straw mulching. The straw prevents evaporation, and its benefit is seen in the growth of the trees.

Mr. Drew.—That is Nature's way. Leaves perform the same office for our forest trees.

ROOT CULTURE.

OLD MISSION, Dec. 14, 1874.

Club met on the evening of this day, Mr. J. M. Pratt in the chair, George L. Roberts, secretary.

Mr. Reese exhibited specimens of ruta-baga and mangel-wurzel, the former weighing 14½ pounds. The ground on which these were grown was manured in the fall, plowed in the spring. The seed was sown on the fourth day of June, and yielded at the rate of 800 bushels to the acre. He thought if the crop had been thoroughly tilled the yield would have been far larger. His mangel-wurzels were injured by the worms; otherwise did well. They are better for cows than the ruta-bagas, as they do not affect the milk, but they are very tender, and as easily damaged by frost as the potato. Owing to their tenderness they are more difficult to handle than ruta-bagas, and are attacked by the cut-worm, though not by the fly. The fly will disturb the ruta-bagas, but they are a harder root than the mangel-wurzel.

Mr. John Franklin.—I drilled in one rod of the Long Orange carrots on unmanured land. I hoed them well, and when they began to root, loosened the ground about them by sinking a spade full depth along the rows. I sowed the seed in the last days of June, and the ground yielded at the rate of 960 bushels to the acre.

Mr. Pratt.—Mr. Lardie says plow very deep for roots. He esteems this essential to success. I put some in early, but the cut-worms took them.

Mr. Parmelee.—Mr. Franklin's carrots were put in weeks later than is usual here. This may be an important fact.

Mr. E. Wait.—I had 800 bushels to the acre of carrots. They were put in late in June. My ground was plowed twice to destroy weeds. They were put in late partly on that account.

Mr. Pratt.—My carrots were up before these were planted.

Mr. Franklin.—There were worms in abundance early in the spring, but none when I planted. The ground was June sod the year before and planted to potatoes. The plowing for carrots brought the rotten sod to the surface.

Mr. Drew.—My experience in raising roots teaches me that the ground must be kept thoroughly clean. If this is done the worms leave. Ducks in the garden at least are a valuable help to keep down the worms.

Mr. Wait.—Mr. Langdon of Elk Rapids put on one-half of his garden common salt. The other half was treated in the usual way. On the first half there were no worms; the other half was destroyed by them. He proposes to apply salt to the whole piece the coming season.

Mr. Parmelee.—A very effectual method of preventing injury to buds on young trees is to place about the trunk a strip of very stiff paper, say four inches wide, folded funnel shape, the upper end firmly and closely secured to the trunk. The worms will go into this funnel, but are not able to crawl down its inner surface and so over it to the young buds.

Mr. Brinkman.—I think Mr. Hedden had some peach trees protected in this way several years ago, but the worms girdled the trees.

Mr. Parmelee.—They must have been very hungry indeed. I have practiced this method with success for years.

Mr. Brinkman.—Coarse straw around young trees effectually prevents the ravages of the cut-worm. Before we leave the subject, let me say that after repeated experiments I am satisfied carrots are a surer crop than ruta-bagas. Even grasshoppers trouble them but little, and they keep longer than most other vegetables. I have fed them until June. The mistake we make is, we plant them too early. Plow the ground, let the weeds come up, plow the ground again, say middle of June, and before another crop of weeds come up the carrots have the start of them. I have raised seventy bushels on sixteen square rods: the variety White Belgian. If you cultivate them by hand twenty inches is far enough between the rows.

Mr. E. Wait.—I plant mine two and one-half feet between rows, so as to plow.

Mr. Drew.—We have raised 175 bushels of carrots on one-fifth of an acre.

Mr. Pratt.—I have pitted 100 bushels together and they kept well.

Mr. Reese.—In Wales I have known 1,000 bushels put together on the surface of the ground, and covered with straw and earth, but in the spring they were full of fibrous roots.

Mr. Parmelee.—I keep the long blood beet over winter in an ordinary cellar, piling them up like wood, end for end. They don't heat, nor wilt, nor grow; and in the spring they are crisp and good.

Mr. Pratt.—I am in favor of carrots for all purposes. My horses don't seem to like ruta-bagas, but all animals eat carrots. I believe I plant too early; I now think the worms take them.

Mr. Brinkman.—My trouble is, the weeds come up before the carrots. Plow twice and plant late.

Mr. Drew.—As between the Belgian and the Orange, you get bulk with the first, but all the best qualities with the latter. They need rich soil and deep plowing.

Mr. Brinkman.—Has Mr. Parmelee ever seen the Pound Pear?

Mr. Parmelee.—Yes, many of them. The pear is large. In Oregon, California, and Missouri they grow larger than with us; but the question is, are they worth anything?

Mr. Drew.—Maj. Brevoort of Detroit gathered sixty bushels of very fair pears from one tree.

Mr. Parmelee.—I hear the Roxbury Russet and the Baldwin are recommended by eastern nurserymen for cultivation here, but the Roxbury here is tender and liable to split, and the flavor by no means equal to the Golden Russet. Nor would it be wise to plant largely of the Baldwin here. The Shiawassee Beauty, a seedling from the Fameuse, is said to be superior to it. I have been in all our orchards, and we have no better apple than the Golden Russet. Neither in the orchard nor the nursery was there any leaf blight, when for two seasons almost every other variety was affected.

Mr. Drew.—We have fair crops of Russets every year; the other varieties are not so uniform.

Mr. Parmelee.—The size of the Golden Russet is no objection to it. There is a demand for large apples, but it is not so extensive as for the smaller varieties.

THE POTATO.

OLD MISSION, Jan. 11, 1875.

Club met on the evening of this day. President Montague in the chair.

Mr. Tracy.—We had not long since a very interesting discussion on root crops, but I should like to hear something more about potatoes. Successful wheat growers harvest sixty bushels to the acre, though twenty bushels or even less is the ordinary yield. The difference, of course, is in the preparation of the soil and other circumstances; but are there any similar facts in regard to the potato? B. K. Bliss & Co. offered premiums for best crop of potatoes, and in one instance a piece of ground, one half acre in size, was made to yield at the rate of 900 bushels to the acre. Now, don't this show we have something to learn on this subject? If sixty bushels instead of twenty bushels of wheat can be raised on one acre, I should like to know if we can't do better on potatoes.

Mr. Marshall.—Last year I raised 260 bushels of Peachblows to the acre on wheat stubble plowed in the fall, but not manured. I planted near the surface and covered well. I first threw the dirt *from* the hills with the horse hoe, going both ways, thus leaving the hills about one foot square; when the small

weeds came up I went over these hills with the potato hook. In the course of a week or such matter, I went through them again with my horse hoe, this time throwing the dirt to the hills. Afterwards I cultivated as I found it necessary or convenient, say three or four times in the season. I made my hills small to save labor—no doubt a light drag would serve this end, that is, save labor. All the hand work was done with the potato hook, as I have stated, except, of course, the work to keep down bugs. Early Rose potatoes should be planted deeper. Straight rows save labor.

Mr. Montague.—My method is much like Mr. Marshall's. In addition, I use ashes and plaster—two parts ashes to one of plaster. This application promotes early growth. I plant early. Perhaps we don't raise so many as we might if barnyard manure was applied. They use this in New York, and raise from 400 to 600 bushels to the acre. Manure of this description might not be so valuable here, but I have no doubt rotted barnyard manure would increase the yield one-third or more. I plant the whole potato. Have practiced both ways, but prefer the whole potato if not too large.

Mr. Tracy.—Mr. Sulter, of Minnesota, raised, I have read, 1,000 bushels to the acre. After hilling up he filled up the trenches with barnyard manure. I believe the variety was Early Vermont.

Mr. Drew.—Three hundred bushels to the acre is a large crop in this country of either Carters or Peachblows.

Mr. Tracy.—How early shall we plant?

Mr. Drew.—That depends on the season. If touched with the frost their growth is retarded,—say about corn-planting time.

Mr. Marshall.—Peachblows start slowly. There is no advantage in attempting to sprout. Early Rose do better not planted so early.

Mr. Reese.—How late should we cultivate?

Mr. Montague.—Not after the tops begin to droop. Our rule is not after they blossom. Our plan is to plant early, go through in two weeks, and again in about ten days. We don't hill at all, but you must throw dirt to the hill or you will have sunburnt potatoes.

Mr. Marshall.—You must keep the weeds out, even if you have to pull them out.

Mr. Montague.—If the ground is crusted, stir it; it may be necessary to do so once a week.

Mr. Drew.—I have known this to be done. Turn over a pasture of say ten acres; plant one half to Early Rose; cut in sets, one eye to the set; plant in every third furrow, ten to twelve inches apart; pass the harrow lengthwise over the rows and recross the other way; then work with the cultivator. This will give a good crop of smooth, even sized potatoes. The remainder of the ground sow to peas. All will come off in time for fall wheat. This will give fine feed for hogs and immense crops may be raised.

Mr. Tracy.—How about drills?

Mr. Drew.—This is the plan in Scotland: They are put in eight inches apart in the rows, and rows twenty inches apart, and crops of 500 or 600 bushels are raised. You can't raise so many in hills. Land is too valuable there to plant in any other way. The average of our potato crop here for the last ten years is about 100 bushels to the acre.

Mr. Brinkman.—More potatoes can be raised in drills than hills. It usually takes twelve hills to the bushel.

Mr. Tracy.—I got one bushel from eight hills.

Mr. Montague.—I have dug one bushel Early Shaw from four hills. I put in plenty of seed, used to cut my potatoes, and put in three pieces to the hill.

Mr. Tracy.—My experience is in favor of drills; the only trouble is the economy of cultivating.

Mr. Drew.—Plow your land in ridges, plant your potatoes on each side of the ridge, split the ridge with the plow which throws the dirt each way and covers the potatoes.

Mr. Montague.—I have seen potatoes planted as Mr. Drew describes. No doubt more can be raised by planting in drills. The trouble is the expense of cultivating, unless you have good tools.

Mr. Chas. Beers.—In New Jersey they plant Peachblows in hills and Early Rose in drills, three feet apart; use a harrow, and when the potato is up plow from it and afterwards throw the dirt to the hill. They use a machine to dig them. The soil is a clay loam. Guano is used as a fertilizer, and barn yard manure and marl as a compost.

Mr. Brinkman.—I think Peachblows should be planted on our heaviest land; you won't get one half a crop on sandy land. Plant Early Rose and Shaws on sandy land,—not Peachblows. My first crop of potatoes here was the best I believe I ever did raise. I planted three pecks of seed and harvested eighty bushels of potatoes, but they were Red Merinos. I don't think Peachblows yield as heavily as some other varieties, but they are the market potato. We plant our Early Rose too soon, I think.

Mr. E. K. Wait.—My Early Rose did better than any other variety. I planted them about the first of June.

Mr. Stone.—I planted my Early Rose about the first of May. They yielded 110 bushels to the acre.

Mr. Tracy.—I am of the opinion that the Fluke, or some early potato other than the Rose, better than that variety.

Mr. Montague.—The Peerless is not so good. It will grow too large, and the quality is inferior.

Mr. Tracy.—I saw at our last fair the best potato I ever saw. It was a seedling from the Fluke, between the Early Rose and Peachblow in ripening. They were remarkably uniform in size.

Mr. Drew.—The English Fluke is not very profitable here. Fifty bushels to the acre is a large crop, but it is one of the very best for baking.

Mr. Reese.—In Europe I have known 800 bushels of this variety dug from one acre.

Mr. Brinkman.—The Early Shaw is a good baker and a good yielder.

Mr. Tracy.—I believe you can get as early a *ripe* potato from the Shaw as from the Early Rose.

Mr. Montague.—The Climax is a fine potato too, but if we raise for market we must grow what people like.

Mr. Tracy.—The Vanderveen will sell well, and there are many other varieties which, perhaps, will sell quite as well in the Chicago market.

Mr. Brinkman.—A Traverse City lawyer told me he wanted nothing but Peachblows. Grand Traverse Peachblows seem to be the favorite.

Mr. Tracy.—The white Peachblow, if we raise any.

Mr. Brinkman.—Plenty of manure plowed under, not too deep, is just what we want. The whole secret is in 150 bushels manure to the acre. A Rhode Island man paid \$4,000 for manure, and got his money back by sale of three crops of potatoes, besides leaving his land in prime order.

Mr. Tracy.—We ought to raise the manure on our farms.

Mr. Brinkman.—Then if we do we shall have no trouble about our crops.

Mr. McCallum.—Manure costs too much here.

Mr. Brinkman.—There is plenty of it at Traverse City.

Mr. McCallum.—But we can't afford to draw it from there.

Mr. Drew.—Manured ground here will bring scabby potatoes.

Mr. Brinkman.—That may be, but I manured ground heavily with coarse manure on sandy land and had no scabby potatoes.

Mr. Drew.—The advantage of Early Rose is, you can get them off in time for a fall crop.

Mr. Montague.—It is a good policy to raise a crop of several kinds. Peach-blows must remain in the ground as long as safe to insure ripening, and if you have a large crop it may be impossible to dig them all. A good plan is to sell part of any crop in the fall and the balance in the spring,—wheat or any crop.

Mr. Drew.—An average for ten years gives us fifty cents per bushel for our potatoes.

WHAT CROPS ARE BEST FOR STOCK.

MAPLETON, Jan. 25, 1875.

The club met according to adjournment on the evening of this day, President Montague in the chair.

Mr. Brinkman read an essay on the following subject, viz.: "How can we best keep up the fertility of our soil," and the club proceeded to discuss the question of the evening, What crops are best for our stock.

Mr. Geo. Lardie, Sr.—I have raised ruta-bagas and turnips for years. They are good for stock, but I think I have found out something better. Ruta-bagas are very good feed in the spring, but in very cold weather they are of little value. For one year now I have tried the squash and find one bushel of them worth three of ruta-bagas. This is true I believe of any kind of squash, though the Marblehead is not so hard and keeps better than most other varieties. It possesses the advantage over turnips for milch cows, the butter does not taste of the food. It is cheaper than the ruta-baga, but must be handled very carefully. This will save them, especially if you have a root cellar. Mine are in a barn cellar and keep well. I have raised on nine square rods of ground one and one-half tons of pumpkin, but the squash has more substance. My pumpkins weighed some of them fifty pounds, and were three feet long. Whether they will keep as long as the squash I can't say, as this is my first year with them, but I have one of them sound yet. For horses and cattle both, and especially for horses, I rank carrots very high. Horses fed moderately on them come out in good condition, and are ready for work in the spring.

Mr. McCallum.—Squashes are good for horses also. Mine ran down on ordinary feed, and I brought them up by this feed. I used the Boston Marrow.

Mr. Marshall.—No doubt the squash is very valuable, but I am in favor of roots also. In fact a variety of crops is perhaps the best, so that whatever may be the season he shall have a crop of something. Corn is a good crop. I am wintering sixteen head of cattle on straw and fodder; have fed no hay yet. I

am satisfied squash is valuable for feeding; also carrots, perhaps better than turnips, though they do not yield so heavily. I would recommend not to neglect corn, and to raise a variety of crops.

In Europe and Asia they use barley and chopped straw for horses.

Mr. Marshall.—I tried barley here for two years, but it was a partial failure; nor do oats do well here.

Mr. A. P. Gray.—My objection to Mr. Lardie's suggestions is the great care squashes require. They take time and trouble far more than roots, and on that ground I favor roots. Some go in for bulk,—whatever will grow most of feed to be used with dry feed. I have had good success with carrots, even as to quantity. I would raise clover, not only for food, but for the land; also plenty of corn fodder. Sowed along from May to July, as we have time, it will produce wonderfully. I have kept stock well on corn fodder and roots. I prefer sweet corn if pure seed could be had. This is almost impossible, and I now raise the large dent. There is no trouble in getting cattle to eat it if cut in the proper time and well cared for. I feed it with no loss worth mentioning, and have more fodder than from the smaller varieties. If you design to use for fodder, cut it up when in bloom, shock it up well and it will keep.

Mr. Parmelee.—Saw at A. K. Montague's several varieties: which does he prefer?

Mr. B. Montague.—He plants at different times, and the difference in appearance is owing to that fact: that planted last is the largest.

Mr. Parmelee.—At what time does Mr. Gray sow carrots? It was said at a meeting at Old Mission not long since, that carrots sown as late as the last of June yielded at the rate of 960 bushels to the acre.

Mr. Gray.—I sow early in May, but if the ground is rich they may be sown later.

Mr. George Lardie, Sr.—I sow carrots about the 15th of May, and always get good crops.

Mr. B. Montague.—This is a very important question, and should be thoroughly discussed. Of course we should raise all the grasses we can, especially red clover, as this is the most profitable of all of them for forage. If well cured it is good hay. Cattle prefer it and so do horses, even to timothy; but if mouldy and musty it is really injurious. The staple grain is corn, of course. I consider it next to hay; in fact, corn fodder can be so cured as to be equal to hay; besides, a much larger quantity of it can be raised on an acre,—three or four times as much. It is as easy to raise four tons of corn fodder as a ton and a half of clover, and the feeding quality is about equal if cut and saved properly. Mr. Gray is right,—corn fodder should be cut in the blossom before the grain hardens, but it must be secured in a sweet state. If sown too thickly it does not properly mature its best qualities. In the dairy districts of New York corn fodder is the usual feed given to milch cows when grass becomes dry. When cows are thus fed they keep up the usual flow of milk. I think on the whole, having raised corn for twenty years, it is the best crop. Here our pastures are limited; and if you have a piece of fodder put in in May, it will be fit to feed when other green food is scarce. In regard to roots, my experience is carrots for horses, enough to feed twice a week, or better still, a few every morning. For cattle the cheapest root is the Swede. On one acre of ground in Jefferson county, New York, 1,505 bushels have been grown at a cost of about two cents and seven mills to the bushel. Our soil is much the same, and we can raise as large a quantity. Four hundred pounds

of ruta-bagas are as good as 100 pounds of hay; and these two are better fed together,—better than twice the quantity of hay alone. The mangel-wurzel is good also, but the soil must be very rich. Dr. Loring of Massachusetts raised 1,800 bushels on one and one-eighth acres. A ton of these is worth more than a ton of any turnips, but the Swede may be raised at less expense; so if they will answer our purpose, they are as a rule the root crop for neat cattle. Squash is no doubt valuable, especially for hogs. Mr. Tracy has fed them with a profit, he thinks; but for late feeding nothing is better than roots.

Mr. Parmelee.—What we should raise for stock depends much on our situation; if our fields are full of stumps the hay crop may cost too much. This, too, must be considered; we do not want to run down our lands. Now, if raising squashes requires high cultivation, it is a different question, and may be attended with difficulty. In some sections, corn is raised crop after crop on the same land. Then, to be sure, the season of sun heat—the decomposing season—is longer than with us, though this question has never been tested here I believe. I have always kept stock, though not as a business, and I endorse what has been said of corn fodder. My young cattle, fed alone on corn fodder, have come out in the spring good for beef. I wanted to hear what those in this neighborhood who raised cattle as a business have to say on this subject. I and many others about Old Mission have our farms mainly in trees. I should like to hear what crops are best to raise in orchards. Now, I know that trees need about the cultivation we give corn. You have better trees and better apples when the trees bear, than if left in the sod. Mr. Marshall, of Painsville, says after trying everything else among trees, he has settled down upon corn fodder as the best. Now, if the crop will pay, it is just what we want for trees, better than potatoes; we dig them late and may start the buds. Buckwheat exhausts the soil, putting nothing back. As a rule, those crops which yield the heaviest quantities injure the soil the least. Now, corn roots fill the whole ground. You would be surprised to find how wonderfully the small roots are spread all through the ground. In raising hay we have this to rely on: the decomposing sod is a fertilizer for almost any crop. In this way the fertility of the soil may be kept up. At Old Mission it was shown lately that roots and carrots may be, and ought, perhaps, to be sown in June,—late in June,—thus escaping the attacks of the early insects. If this is true it is an important fact.

Mr. George Lardie, Sr.—It is objected that squash raising is too expensive; but what will prepare land better for another crop? If we could raise ruta-bagas as they do in New York, I would raise them. Corn fodder is good, but six or seven tons of squash to the acre is better.

Mr. Tyrer.—Years ago I landed three families at Whitewater late in the season. They each had a cow, put in turnips and wintered their cattle. Turnips for calves, even with straw alone, will keep them in good order. Feed half turnips and half hay if you want fat cattle. All dry feed won't do. So of horses: two-thirds oats and one-third peas is the very best feed for horses.

Mr. Parmelee, in reply to a question by Mr. McCallum, said when successive crops of corn were raised for years on the same land, the stalks were not cut for fodder, but were burned in the spring.

Mr. McCallum.—And perhaps cattle allowed to run in the fields in the winter.

Mr. Montague.—Not only stalks but straw are burned in some fertile sections. Corn, no doubt, does not impoverish soil so much as some other crops.

Mr. Tyrer is sound on the turnip question. In England this is the staple crop with stock growers, and here the more roots we raise the more stock we can raise, and the more manure for our fields and orchards. Corn does well among orchards and orchards well among corn, and I see no difference between sowed corn and that planted in hills. In regard to sowed corn it is a mistake to sow too close. The closer the corn is grown the less valuable it is. It wants light and air, and to be in a condition to produce corn. I prefer a large growth of stock, and if this is cut at the proper time you have the whole substances for forming the ear as well as the stock.

Mr. Brinkman.—I admit we ought to raise roots and green fodder, but I think no more fodder than to summer cattle, nor roots than to winter them. If you want to go into the business extensively, you must manure heavily. Near a city you may do this, but most of us keep cattle for use only, and raise crops for a living, relying mainly on our trees. We must raise clover. Subsoil the land, plant to clover, and you have a heavier crop of roots than hay. We must increase the fertility of our soil.

Mr. Drew.—Our corn crop is one of our most valuable crops. We tie the fodder in bundles, set it up in stooks, and draw it in as we need it. Our orchard we planted in corn till the trees began to bear, thereafter the trees had the whole benefit of the ground.

Mr. Marshall.—We gave them, in addition, nearly all the manure we made. Our wheat crop was nearly a failure, but our mixed crops, corn, roots, potatoes, etc., reached nearly 4,000 bushels, showing the value of mixed husbandry.

Mr. Brinkman.—We can't get corn fodder to use before the first of July, but we can use clover earlier, and ten acres of clover can be raised as easily as one acre of corn. If that is so, I think we had better stick to clover.

Mr. Montague.—I cut clover from middle of June to middle of July, then sowed corn is fit to feed to cows. The New York dairymen passed a unanimous resolution that green corn fodder was very profitable feed for cows.

Mr. Gray.—I use about three bushels of corn to the acre. Prepare the ground early, harrow it, have my furrows about three feet apart, drill in the corn by hand, drag just before the corn comes up, then cultivate three or four times during the season. I put in the corn at different times, as may be convenient. I cover by laying the plow down and dragging it over the rows. The cost is not more, I should think, than \$13 per acre. Farmers sometimes complain of want of time. Plow early, as early as possible, and put in what you can. One acre, with ordinary pastures, will keep several cows in good flow of milk.

Club then adjourned to meet at Old Mission, Monday evening, February 1.

GEO. L. ROBERTS,

Recording Secretary.

DISCUSSIONS OF THE SOUTH HAVEN POMOLOGICAL SOCIETY.

REPORTED BY SECRETARIES C. T. BRYANT AND H. E. BIDWELL.

OFFICERS OF THE SOCIETY FOR 1875.

President—T. T. Lyon.

Vice-President—George L. Seaver.

Treasurer—C. J. Monroe.

Secretary—H. E. Bidwell.

Librarian—Alfred Fitch.

Entomologist—A. Fitch.

Ornithologist—L. H. Bailey, Jr.

Executive Committee—W. H. Hurlbut, A. T. Linderman, and T. A. Bixby.

NOTE.—South Haven is now a village of about 2,500 inhabitants, although five years ago it numbered but 400. It is situated at the mouth of South Black River, on the east shore of Lake Michigan, 64 miles (seven hours by boat) from Chicago. It is 25 miles northeast of St. Joseph; 23 miles south of Saugatuck, and 60 miles south of Grand Haven, in the midst of the prominent fruit-producing points of West Michigan, and possesses all their climatic advantages. It is the northwest township of Van Buren county.

THE QUINCE.

SOUTH HAVEN, Van Buren county, }
January 12, 1874. }

The subject for discussion was "The Quince." The following were the principal items brought out:

Comparatively little attention has been paid to this fruit here. The larger orchards are not yet of bearing age. Those trees which are of sufficient age are mostly yielding well, and the fruit is very fine. The conditions generally recommended by the best authorities, for the successful growing of the quince, were confirmed by the experience and observations of those present, viz: a mellow, moist soil, or if naturally dry, kept moist by heavy mulching, or by being in the shade of a fence, bank, buildings, or something else. A moderate sowing of salt about the trees, not coming in contact with the leaves or body, is considered beneficial. A northern exposure, being coolest, is best.

Mr. Bidwell thinks quince trees grown from seed to be budded, would be more vigorous and less apt to sucker than those grown by cuttings.

Mr. D. B. Williams and others argued to the contrary.

Mr. Bailey has several seedlings growing by the side of Orange quinces, with the same treatment, which he thinks are nicer than the Orange quince.

There are trees in the vicinity over thirty years old, still vigorous and producing well.

Mr. Bidwell claims quince trees should be grown as standards, not bushes.

PREPARING LAND FOR TREE-PLANTING.

SOUTH HAVEN, January 19, 1874.

The question, "How shall we prepare land for planting trees? what to do with stumps,"—a special consideration,—was discussed with much animation.

On the question whether, if the timber had been cut several years, so that at least half of the stumps could be pulled out with a team without much grubbing, it was economy to remove *all* the remaining stumps before setting a peach orchard, barely a majority voted in the affirmative, these including several of our most extensive and experienced growers of fruit among stumps.

On the question whether it would pay to take out all the green stumps from a piece of heavy timbered land just cleared to set a peach orchard on, only Mr. A. S. Dyckmann voted in the affirmative. The others thought it would be best to wait at least three years after the timber was cut, and then some would remove all the stumps; but others, as many as could be without an extravagant amount of labor, and removing the rest at leisure.

All seemed to think that hemlock, pine, black walnut, white oak, and such lasting stumps, had better be removed first as last.

Sinking very large stumps was recommended by some, but disapproved by others because they seemed to form an acid in decaying which was unhealthy to fruit trees.

Mr. Bailey's premium apple orchard was set among green stumps, before all the logs were off.

It was estimated by some that the advantage of setting trees on new land made it an object to remove the stumps for that purpose before they were fully rotted. The opinion of each seemed to be prejudiced by the consideration whether he had considerable cash capital to invest, or little but his own labor.

The stumps being disposed of, the necessity of removing standing water below the reach of the roots, by draining if necessary, or sub-soiling and thoroughly mellowing hard soils, and putting good soil about the roots of the trees, was generally insisted on; also of leveling the ground, or so much so as to have the trees set on a general level. Planting on ridges was condemned, as the soil would be worked away and leave the roots bare.

CARE OF YOUNG ORCHARDS.

SOUTH HAVEN, February 2d, 1874.

The subject for consideration was "The Care of an Orchard for the First Two Years."

A good proportion of our principal fruit-growers were present, and advised the following practices:

First.—Remove standing water from the soil by surface or underdraining.

Second.—Get good trees.

Third.—Deeply and thoroughly pulverize the whole area to be planted by subsoiling if possible.

Fourth.—Dig holes at least three feet wide and eighteen inches deep, and fill with rich mould.

Fifth.—Set very carefully after pruning from the under side all roots the ends of which have been cut in taking up, and cutting off at least two-thirds of the top, removing superfluous limbs and shortening the rest, leaving three or four buds of the last growth. The object of cutting away the top is to prevent the tree being killed or stunted by greater evaporation than the roots are able to supply at first. The roots should have the advantage and commence growth first. Plant deeper in light than in heavy soil. It was generally recommended to cut away the branches of a peach tree at setting, forming an entirely new top from the strongest buds on the stock, also cutting off the top of the stock nearly as low as it was desired that the head should form. Some thought more buds should be left than the desired number of limbs, for the cut-worms when they are troublesome. Strips of tin tacked tightly around the bodies of the trees have been found effectual to prevent the worms climbing the trees.

Sixth.—Some recommended leaning trees to the southwest and pruning so as to leave the balance of the top on the windward side. Others thought it would pay well to stake the trees the first two years, constantly straightening those which gave to the wind.

Seventh.—Give as good cultivation as for a first-rate corn crop. Most would stop cultivating early in August, so as not to stimulate to a late growth. Some considered it well to grow corn among the trees the first two years, while one objected that the trees would be so shaded they would not grow stocky.

Eighth.—In light soil a little manure is well for peach trees, and apple trees will be benefited by considerable manure.

Ninth.—The trees should be washed with some alkali often enough to destroy insects and keep the bark smooth. One quart of soft soap to a common wooden pailful of tolerably strong lye, with a little lime in it, has proved satisfactory.

Tenth.—During the first two years it is very important to give direction to the limbs and shape to the tree by pruning and pruning back during the growing season. Too many main limbs are generally left.

MARKETING FRUIT.

SOUTH HAVEN, Feb. 9, 1874.

Mr. H. E. Bidwell made a few remarks, as follows on marketing fruit:

While waiting at the depot at Dover, in Delaware, last fall, and looking at the stacks of empty peach baskets at the side of the railroad track, I observed to a fruit grower there that those baskets looked as though they had seen service. He remarked that they had probably been to New York one hundred times within the past five years. I should have been ashamed to have told him that in Michigan we covered our peaches with a veil and gave away the basket with the peaches,—some being glad to do so if nothing would be said about the contents.

Now, gentlemen of the South Haven Pomological Society, I claim it does not pay our society to give away 50,000 baskets, as we did last season, with our \$3,000 and \$1,500 worth of tarlatan. One of the principal peach growers in Delaware told me they had no trouble in shipping peaches in open baskets by regular freight. They had done it several seasons. They simply instructed the commission men in New York or elsewhere not to receive a package if any of the peaches were removed. I asked him how they got their baskets all back. He replied that they were charged separately, and paid for or returned. They kept a separate basket account. It is an undeniable fact that the people who buy peaches in New York live at a greater distance from the seller than the people of Chicago do. It is another fact that the basket is of no practical use to the buyer after carrying the peaches home. Can the people of Chicago better afford to buy baskets to throw away than the inhabitants of eastern cities, or can we better afford to give away the hundreds of thousands of baskets in the future? All you want is the resolution not to do it. I know after the flush prices of last season you will hesitate to do it, but now is the time. Retrenchment is the order of the day. Neither you nor the buyer can afford it hereafter,—better spend the money on your orchards. Grow larger, handsomer, and better peaches,—let more sunlight into your soil, trees, and peaches,—leave off your deceptive tarlatan; you can do better; it does not pay in the long run; you have to pay for the deceits practiced under it. Let tarlatan blush for green and rotten Hale's Early, or hide with shame other imperfect specimens; it cannot improve the beauty of our trade-mark peaches. This Pomological Society was organized for the purpose of improving our fruit and increasing the facilities of marketing. By doubling the size of our baskets we can decrease our freight by boat one-half and commission one-quarter. We make a great mistake in shopping to too many different commission men. A man no sooner finds a way of disposing of our fruit than we try some one else. This society ought to know who are good men, and have confidence in them. Let fair dealing prove your men, and stand by them. We cannot afford to have so many runners here every season soliciting trade. You have to pay their time and expenses. Better sell your peaches at home at a fair price than take the risk of a fluctuating market. Label your fruit with kind and quality, so that all peaches will not be sold for No. 1 Crawford's. Another mistake is made in picking peaches too green; one-half the Hale's Early that were shipped from this place last season were not worth the picking. Your Delaware and Concord grapes are often shipped half ripe. Your winter pears are not fit to put on the market in the fall without labeling them as winter fruit. You try

to grow to many kinds and varieties of fruit. There has never been any risk in growing specialties of fruit in this section. There is a greater risk in neglecting one fruit at the expense of another. Peach, pear, apple, grape, and small fruit, each requires time and experience in its separate management for marketing. In conclusion I may say that the useless expenses herein mentioned would make a handsome profit on the cultivation of peaches.

Mr. C. J. Monroe said from what he could learn in picking peaches, the trees should be carefully looked over each time, taking only those which would arrive in market in good order. Thought it best to ship to one house, one you were acquainted with and had confidence in, and who had confidence in you. See that the fruit was put up all right; would label it and mark it well; would use the cheapest and best package and have it returned; thought we ought to try to furnish the buyer fruit as cheap as we could. While the large grower could afford to use tarlatan and expensive packages, the majority could not.

Mr. E. J. Lockwood would recommend picking over several times; thought we were not careful enough; was afraid they would steal more if the packages were left open.

Mr. John Williams said in marketing we should know the state of the market; was troubled in collecting shortage; was careless in shipping to too many; should take more pains in picking and packing; thinks much might be gained by co-operation; we lacked confidence in each other and in ourselves; should be more particular in assorting, using the poor ones at home; it would make better prices for the good; baskets and covering were too high; tarlatan tends to deceive; would recommend leaving off the tarlatan and shipping in the Dyckman crate.

Mr. Windoes remarked that his first shipment to Chicago was an expensive failure, and afterwards he had preferred to sell at home, in Kalamazoo, where he received satisfactory prices.

Mr. A. S. Dyckman thought the first and most essential feature in marketing was to raise first-class fruit, which he believed would eventually market itself; believed in thorough cultivation and thinning. In picking Early Crawford this year he picked every day for two weeks. Would dry or can the soft peaches. He thought there was a class of buyers in Chicago that had a pride in carrying home handsome packages of fruit, beautifully tarlatanized; there was another class would prefer cheap packages; thought early peaches best sent in pack baskets; has sent late peaches long distances in bushel boxes. In reply to what the first cost of his crates were he said about fifty cents; used his crates over several times last season; they were well returned. Ships to one house in a place; thought small lots should be combined here and go to one house.

Mr. I. S. Bunnell said much can be done by co-operation. He has 400 bearing peach trees; thought we ought to ship together; believed we could get orders to ship trade-mark fruit direct to consumers; apples were sent so from Hartford to Iowa.

Mr. Wigglesworth does not think poor fruit should be grown; thought it would pay to go over to Chicago and see fruit sold; tarlatan pays on poor fruit; the baskets cannot be returned; shipped to nearly every commission house in Chicago last season, but cut down to two in the fall; fruit looked larger under tarlatan, and it improved the color of grapes.

Mr. C. M. Sheffer thinks we cannot grow all large fruit; mixed large and small peaches in the basket and was satisfied with the result. The packages

should be better protected; prefers the splint-top basket with oval top; does not believe in shipping to one man lest he will be overstocked. A good, honest man will do as well for a small as a large lot.

TRANSPORTATION.

SOUTH HAVEN, February 16, 1874.

The subject for consideration was "Transportation."

Mr. C. H. Wigglesworth was appointed to make the opening remarks. He urged strongly the necessity of securing a boat to run direct from this port to Chicago, daily if possible, which should be committed principally to the fruit interests of this place. The boats we have been dependent on made our fruit a secondary consideration, usually delivering the fruit at Chicago too late for the early trains and the best market, whereby we lost from ten to twenty-five or more cents per basket or crate. They were also very careless as to where they placed the fruit in unloading. He thought that a boat could do a profitable business from this port alone if the merchants and others would, as they should, transport their goods by it, and if effort was made to secure travel and freight by way of the railroad.

The suggestions of Mr. Wigglesworth were generally approved, and Mr. E. J. Lockwood moved that the president appoint a committee to negotiate for a boat, and to arrange for the best facilities for transportation. The motion prevailed.

Mr. J. Williams urged the importance of shippers marking packages carefully, taking full receipts, seeing that their shipments were properly billed, instructing their consignees not to receipt for or pay freight or express on any but such as was delivered in good order, and then to promptly demand reparation for damage or shortage.

Some codling-moth millers were exhibited in a jar, placed there by Mr. L. H. Bailey, and hatched out after having been subjected to severe freezing.

SOUTH HAVEN, March 2, 1874.

The subject of packing fruit for shipment was taken up from last week.

Mr. Wiley of Saugatuck was present, as a representative of the fruit growers of that vicinity, to confer with this society in reference to some change in the present system of marketing fruit. The report of last meeting on this subject was read. Mr. Williams corrected the statement of the report in reference to the cost of freight on the boxes mentioned. It should be ten cents per half bushel box. He thought the whole package of four boxes might be shipped for twenty-five cents.

Mr. Wiley sustained the position taken by Mr. J. Williams at the last meeting. He showed that the expense of packing, freight, and commission was about \$1 38 per bushel, as much as common peaches were worth when there was a good crop. He asserted his belief that in a few years, in a favorable season, very little profit would be realized from peaches unless some cheaper packages and cheaper freight prevailed; that we could not look forward with success in the business unless the present expensive methods were done away

with. He insisted on no particular system, but the fruit-growers of Saugatuck and vicinity wished to unite with us and other communities in establishing a way of marketing fruit at less expense. He favored the box described by Mr. Williams at the last meeting (of which Mr. Wiley was the inventor). A saving at present rates could be made of at least 26 cents per bushel for freight alone. We could also avail ourselves more fully of our railroad facilities. He acknowledged the prejudice which existed against boxes in Chicago, caused by the poor fruit shipped in them from the south, but thought that if Michigan fruit-growers would unite in using such a box as these, and ship only No. 1 fruit in them, this prejudice could be overcome. These boxes could be covered by tarlatan if it was desired, and the covers removed by the salesman to show the fruit.

Mr. J. Williams thought that if a part of the expense saved by the boxes was expended in calling attention to them by advertising, the objections to the boxes would be in a great measure overcome.

Most of the others thought the strong prejudice against boxes in Chicago, and the disposition of human nature to choose that which looked the nicest, were points in favor of baskets covered with tarlatan, which they hesitated to risk much in trying to overcome.

Mr. A. S. Dyckman stated that fruit in baskets was so much more attractive and salable in Chicago than that in boxes, that commission men were in the habit of repacking peaches which came from southern Illinois in boxes into baskets, and making a large profit by the change; and large producers there had found it to pay well to get baskets from Michigan and pay the extra expense. He had, however, sent late peaches a thousand miles and more in bushel boxes, and was well satisfied with the results. He had found peaches to sell as well in boxes in eastern cities, Detroit, and smaller towns in the country as in baskets.

Mr. J. E. Windoes gave his experience in baskets as similar to Mr. Dyckman's. Mr. Williams had the same experience.

It was stated that as much deception was practiced in close packages as in open ones; that fruit showed to better advantage in round heaped packages than in square, level-filled ones, and that both the salesman and the shippers of the fruit were strangers to most of the customers, and their guarantee was of little account.

Mr. Wiley thought still that we would see the necessity of a change to cheaper methods.

The importance of looking up country customers, shipping direct to them, and avoiding Chicago, was urged.

THE NEW METHOD OF SCARING THE CURCULIO.

SOUTH HAVEN, March 25th, 1874.

The table was spread with apples from the orchards of Mr. Bailey and Mr. Bixby. The Fall Pippins in both collections were very fine. Mr. Bailey's Spitzenburgs, Swaars, Northern Spys, Baldwins, and Canada Reds were large, handsome and crisp,—perfectly splendid.

Mr. Windoes was requested to give his new method of destroying the curculio,—to encourage the planting of plums and apricots, which was as follows :

Could we control the ravages of the curculio, that little turk that gives us so much trouble in the culture of the plum, I feel free to assert that this would be *one* of the most, if not THE MOST profitable of our whole list of fruits. As a dessert fruit it is one of the best, and for canning is surpassed by none. The tree is perfectly hardy and no degree of cold affects it. It is true the black knot affects it in some localities, particularly at the east, where it has been largely cultivated in place of the peach because of its hardness.

Of late, however, the curculio has proved its greatest enemy, and any successful method of preventing the ravages of this insect will be appreciated by all fruit-growers.

By accident I discovered a remedy that with six years' experience I feel safe to recommend as effectual. A year ago I gave the process to some members of this Society, and also to Mr. Wiley of Sangatuck, who promised to give it a fair test. There being so many worthless remedies recommended I sought the experience of others before making this public. They failed to make the experiment, perhaps not thinking it worthy of a trial. But as the material used costs but little, and the *process* costs still less, at the request of several members of the Society I submit it to you. Most of our fine fruits are chance seedlings, and many of the methods of protecting fruit and trapping insects are accidental. So it is with this.

In the spring of '68 while catching curculios by jarring and trapping, I had occasion to empty a kettle of coal tar which I had been using for tarring fence posts, and to destroy the same I set it on fire near my plum trees, not with a view to benefit the trees, but to get rid of the material. The next day I found that a plum tree near by, which was covered with the smudge, was deserted by the curculios, and I at once procured another supply and continued its use on a part of my trees. From those so treated I obtained a good crop of fruit, while on the others but few perfect plums ripened.

In 1869 I mixed one pound of sulphur with one gallon of coal tar, and as soon as the fruit burst its petals commenced its use. To make this convenient I procured a large frying-pan, fastened a long handle to it the more easily to use it, and very early in the morning, while wet with dew, processed the trees oftentimes making the foliage black with the smoke. This was continued each alternate morning until the fruit was as large as a small-sized hickory nut. The trees were a perfect wonder to all who saw the immense crop of perfect fruit, and it had to be thinned out to prevent the trees from breaking under their burden.

The following year, being absent at the proper time, nothing was done and the result was no fruit at all. In 1871 I again tested the process, and also by furnishing the material induced a neighbor who had some fine trees in his garden to do the same. He was very incredulous, and it had to be *works* without faith that produced the results. From seven trees he sold \$24 worth of fruit, not taking into account what they used while fresh or for canning. My crop was abundant, while on the other side on the adjoining lot a neighbor who had trees did not secure a plum.

Each year since I have continued the process with like results, while the neighbor before spoken of being sick at the proper time failed entirely. These experiments have convinced me that with a reasonable amount of labor the

plum crop is a certainty, and most varieties being annual bearers will make it a profitable crop for market.

The Society returned him a vote of thanks for the valuable information.

THE PROFITABLENESS OF SMALL FRUITS.

SOUTH HAVEN, April 6, 1874.

The subject for discussion the evening of the 6th instant, was the continuation of the previous Monday evening's question,—the profitableness of small fruits.

Inasmuch as Messrs. Wigglesworth and Histed had the most experience in small fruit culture, Mr. Wigglesworth was called upon to make some additional remarks to those expressed at the last meeting. He said he could grow 100 bushels of *Triumph de Gand* strawberries on an acre as easily as he could 200 bushels of *Wilson's*. The former brought twenty to twenty-five cents per quart last season (instead of forty to fifty cents, which was the highest price they sold at in Chicago), while his *Wilson's* only averaged twelve and a half cents per quart. When the cost of boxes, picking, and shipping is taken out it left the *Triumph de Gand* far ahead. This is the most conclusive argument for the cultivation of choice fruit; you get a greater profit for a smaller amount. Lest some might be disappointed he said *Triumph de Gand* and *Jucunda* would not succeed on light sandy soil.

He replied that red raspberries were very profitable, and the market would not be overstocked, as they could only be grown in favorable localities, where they could be shipped by water. When shipped by rail they shook together and spoiled in the heat at that season of the year. He thought highly of the *Clark* raspberry; they sold readily last year for twenty-five cents per quart, the *Philadelphia* brought seven dollars per bushel. He would recommend the *Franconia* and *Brinckles' Orange* raspberry, and the mammoth cluster black-cap raspberry. Black caps yielded from 100 to 150 bushels to the acre, and for \$5 per case. *Kittatinny* blackberries yielded 100 bushels to the acre and sold last season for \$8 per bushel. Would recommend setting small fruits in the spring, and the use of *Perry's Scar* in keeping down the weeds in summer. Would cut out the old canes in the fall and mulch with coarse litter. Would use straw or marsh grass for strawberries, covering evenly and thinly, which should be separated from over the plants in the spring, leaving it as a mulch until the fruit ripened, then removed for the purpose of cultivation. He thought decayed sawdust would be a benefit, especially hard-wood sawdust: would prefer whitewood and basswood to pine and hemlock.

Mr. Hurlbut said he mulched with green sawdust in the spring and thought it an injury.

Mr. H. Linderman mulched with straw in the fall and left the vines to come up through in the spring, with good results. It kept the fruit free from the dirt.

Mr. Voorhees said such was his experience.

The question was raised whether it was a good plan for large fruit growers to meddle with small fruits.

Mr. Hurlbut said he thought small fruits like mixed husbandry in farming, —a benefit to the peach grower, as it furnishes constant employment to labor, the proceeds of which helped to furnish means for the support of the orchard.

Mr. Wigglesworth said that the gathering of raspberries and blackberries, which required the most time and greatest labor in the cultivation of small fruits, interfered with the thinning and picking of peaches.

No question was raised as to the comparative profitableness of growing different kinds of small fruits, because all pay.

THE CODLING MOTH,

or parent of the apple-worm, was next brought up.

Mr. Bailey said the miller was about half an inch long, of a gray ash color, with a brown and bronze colored spot on each wing, the male having short black hairs on the upper part of its back wings. The worm when full grown is about three-fourths of an inch in length, of a pinkish color, with a brown head. He found the miller flying about his house at dusk lately. They flew up and down in a zigzag motion, and not sideways. Had frequently noticed that they flew towards the light, and could easily be caught by clapping the hands together down and upwards. He thought they came from his apple barrels in his cellar, where they had hatched this winter. Had hatched many out in jars recently. Mr. Chatfield, his neighbor, had found them hatched under cloth bands in his orchard this spring. Mr. Bailey said that the silken cocoons could still be found under the rough bark of the apple tree and in the crevices near the base of the tree. He thought that if we all united in destroying them they could be kept under control, and after we had done all we could we might call in the birds to assist us.

Mr. Hurlbut said that when the apples were young the eggs were laid in the calyx: the eggs were about one-eighth of an inch in length and nearly white. When the apples were larger they would frequently be stung on the side. By stinging he meant where the worm entered the apple. The eggs must be laid all summer, as the worms could be found at all times under the bands in different stages of development.

Mr. Wigglesworth would recommend the use of tar barrels to catch the millers in.

The following letter from the Michigan Farmer was read by the secretary:

DETROIT, April 4, 1874.

Mr. H. E. Bidwell:

DEAR SIR:—In reply to yours of March 30th we would say that we will put your society on our list free, as we think it will pay us to have it on file there.

Very respectfully yours,

JOHNSTONE & GIBBONS.

Whereupon a vote of thanks was tendered them by the society, and on motion of D. B. Williams they were made honorary members.

A postal card was also read, from the secretary of the Lake Shore Agricultural Society at Saugatuck, as follows:

SAUGATUCK, Michigan, March 30, 1874.

To the Secretary of the South Haven Pomological Society:

DEAR SIR:—The Lake Shore Pomological Society at a recent meeting instructed me to write to you in regard to the present mode of marketing fruit in Chicago, and I cannot ex-

plain it better than by sending you a copy of the resolutions introduced and read before our society :

WHEREAS, The present mode of marketing fruit in Chicago has proved very unsatisfactory to the producer, and ever must continue so long as we compete against ourselves by placing our fruit in the hands of competing commission men (which every producer does who consigns his fruit to two or more commission men) without any final system for regulating a uniform price; and

WHEREAS, By co-operation of this shore much that is objectionable in the present system may be entirely obviated; therefore be it

Resolved, That this society respectfully request the fruit growers of St. Joseph, Benton Harbor, with South Haven, through their fruit-growers' associations at those places, to suggest some mode of marketing the peach at Chicago in which this whole shore can co-operate, or call a convention for adopting some plan to regulate an established price.

By presenting the above to your secretary at the earliest opportunity, and by sending the result to us, you will oblige this society.

W. CUMMING,
Secretary L. S. A. & P. Society, Ganges P. O., Allegan county, Michigan.

By request of the committee on Transportation, these resolutions were adopted by our society, and the secretary requested to notify the associations of St. Joseph, Benton Harbor, and Saugatuck to meet in convention as early as practicable

SHADE AND ORNAMENTAL TREES.

SOUTH HAVEN, April 12, 1874.

Shade and ornamental trees and plants were brought up, for the purpose of improving our taste for the beautiful as well as for the useful, to make our grounds in connection with our orchards more pleasant and attractive.

Mr. A. T. Linderman recommended the native hemlock as one of the most useful for wind breakers and hedges, and beautiful for a lawn tree, as it could be trimmed into a handsome pyramid without the liability of losing its lower branches, which was a great defect in the balsam fir. He recommended the Japan quince for small yards, as they also could be trimmed into any desired shape. He spoke highly of the beauty of rose gardens planted in squares, and recommended rotten sod as one of the best manures for trees or plants.

Mr. Seaver favored the elms for shade trees.

Mr. D. B. Williams said a yard was not complete without ornamental trees. Large yards were best set with Scotch and Austrian pine in a grass plat. He spoke favorably of the Japan quince and Arbor Vitæ.

Mr. Dyckman did not approve of setting too many evergreens in rows; thought thickets and solitary trees, interspersed with open lawn, gave a beautiful effect.

Mr. Monroe said our greatest need in the improvement of our village was street shade trees.

Mr. Dyckman suggested that they be well protected with boxes.

Mr. Williams advised the driving of small finishing nails in the trunk of the tree instead of boxes.

In answer to the question as to which of the maples were preferable to set, Mr. Linderman said the hard maple was best. He also spoke highly of the basswood for a shade tree, although it was difficult to transplant.

Some inquired for the best method of transplanting nut trees, and they were recommended to cut off the tap root the year previous to setting them out.

MANURING ORCHARDS.

SOUTH HAVEN, April 18, 1874.

The president laid on the table some well preserved specimens of Greenings, Seek-no-further, and English Russet apples, the latter looking as though they would keep a year longer. The Seek-no-further were as handsome as though they had been dipped in our beautiful sunsets.

The question of manuring orchards was called up.

Mr. Fitch said he was hauling his low land deposits to the higher land with good results.

Mr. A. J. Pierce believed the best way to get rich was by getting more manure. Thought leaves one of the best manures. If manures were difficult to get, would recommend more cultivation.

Mr. J. W. Pierce had observed that orchards too highly manured increased the size of the fruit, but injured its flavor. Thought mulch desirable for shallow soils.

Mr. Lathrop recommended the use of more manure. Excepting for peaches and cherries, he thought we could not manure too highly. Would compost manures first. Ashes, lime, and muck made a good compost. Would keep lime and fresh manure apart. Said all that were recommended for sand required less manure than those which required a heavier soil.

Mr. A. J. Pierce said, Never run in debt when you buy manure.

Mr. Hurlbut said he had not had much experience in using manure. His land was mostly good enough without. Those trees in his garden which had been highly manured had done the best for the first ten years, and those in the grass had done the best for the second ten years. He thought fruit trees could be manured too highly. Would recommend clay as a good manure for sand, also the prunings of trees cut up short and spread on the land.

Mr. Windoes had great faith in manures, when properly applied. A peach tree manured with night soil had on eleven peaches measuring from $10\frac{1}{2}$ to 12 inches in circumference. Had experienced manuring 800 pear trees, part with barnyard manure, part with raw-bone phosphate, and the remainder with bone dust. The first produced the quickest effect and the latter the most lasting result. Thinks bone dust best for grapes, though fruit when manured larger and later. Could increase small fruit 50 per cent with the use of manure. Believed manure paid well.

Mr. J. M. Stowell said his father astonished his neighbors by the size and quantity of his fruit, which was caused by the use of plenty of manure.

SOUTH HAVEN, April 27th, 1874.

President Phillips exhibited a peach limb with tent caterpillar eggs on it, some of which he hatched out by taking them in the house. The moth seldom lays its eggs on the peach, as the young worms do not like the peach foliage; but insects sometimes make mistakes, and we should be the more careful in watching for their eggs to destroy them. The eggs are glued to small limbs, and pass clear around so as to look like the swelling of a limb. They are usually found on cherry trees, and can be seen quite readily at this season of the year by their silvery appearance. There are frequently seen a nest of other eggs rolled up in a leaf and attached to the limb. These should also be removed when pruning. A little watchfulness will save time when the trees are covered with foliage.

The question for the evening, the president said, was a broad one, and he thought it advisable to first say something more concerning manures.

W. H. Hurlbut said any warm land would be benefited by the use of hard-wood sawdust, which we could get for the hauling. He would use it as a mulch around trees. He found on examination this spring, that the old bark of apple trees under the sawdust was replaced by a new one, and new roots were frequently found, showing it had some fertilizing effect.

A. T. Linderman thought the softening of the bark at the base of the tree might be an injury.

Geo. L. Seaver said he used sawdust around currant bushes with a marked benefit.

D. C. Loveday had used old hard-wood sawdust around Osage, and could see a great improvement over those where it was omitted. Another benefit was, the plants did not heave where it was used. He designed using it for strawberries; thought it was best to put it on in the fall.

A. Fitch said grass or hay was very beneficial.

A. T. Linderman said we should be cautious about the use of sawdust. He would put it on the soil and not in it; if put in the soil it would fire flange and develop fungus, and he had traced club-foot and woolly aphids to its use on apple trees in the nursery where it was plowed under.

D. C. Loveday said his neighbor killed his currant brush by putting on too much sawdust.

A. T. Linderman thought clay beneficial spread on sand. It answered as a mulch, and was one of the best manures when worked into the soil.

W. H. Hurlbut knew of a clay subsoil benefiting a clay loam.

A. Fitch had seen rank growth along the sides of ditches where the subsoil was thrown out.

Harvey Linderman thought the drainage was more beneficial than the subsoil. He would not discourage the use of subsoil; sometimes it contains elements needed by the soil. He thought it should be used first on a small scale as an experiment, and, if successful, it might then be increased; if not required by the soil it would not pay.

G. W. Byers related a case where in draining a piece of land the subsequent crop showed where the drain lay.

W. H. Hurlbut said that with trees as well as grain crops the soil needed deep drainage.

G. L. Seaver wished to say more about shade trees. He thought we ought to set more elms, as they were longer-lived and more handsome and beneficial fifty years hence when the short-lived maples would be dead. In reply to the proper distance to set shade trees, Mr. S. said they should be set further apart, twenty to thirty feet instead of ten to twenty.

W. H. Hurlbut said the elm stood the most hard usage of any tree; would recommend the white elm.

A. T. Penniman thought elms might be interspersed with maples.

PEACH CULTURE.

SOUTH HAVEN, May 4th, 1874.

The question for discussion and remarks last Monday evening was "Peach Culture in all its Parts."

E. J. Lockwood introduced the subject with a very truthful remark that the more he studied peach culture the more he found he did not know, and wished to ascertain as to the best method of pruning a peach tree before setting.

H. Linderman said what information he could gain from observation led him to believe that more top should be left on. Frequently trees with good roots were cut to a single cane, and he thought lost time in replacing the top.

E. J. Lockwood thought we did not prune sufficiently when the trees were young.

C. T. Bryant said that it was advisable not to go to any extreme. If too much top was left on the dry weather following would produce more evaporation than the roots could sustain. In pruning bearing trees he would thin out, leaving short limbs to cause them to thicken out; this gave a tendency to check the too rapid flow of sap to the ends of the main limbs. If the trees were old he would cut back to form a new top. In pruning he aims to cut more on the north-east because there is the least sunlight on that side.

George Bridges asked if it was best to leave any weak limbs, and answered it by saying if they were on the decline why not cut them out?

L. H. Bailey remarked, Prune the trees while young to avoid the necessity of removing large limbs when the tree became older. In cutting off large limbs he found it checked the flow of sap up that side, to the injury of the tree. He would urge more care in thinning the tree while young to avoid this heavy thinning later.

C. T. Bryant said he would leave short spurs on the main limbs and not remove them all at once, as they assisted in developing the limbs, making them more stocky.

A. J. Pierce said he would not advise heading back all the limbs as recommended by some, as this filled the tree full of small limbs which would cause some of them to die out, but he would cut back the leading long limbs and thin out the small ones.

A. T. Linderman would leave small spurs on the trunk of the tree, as it protected it from sun scald and blight. Would caution against pruning too early in the season as it tended to produce water sprouts; would recommend leaving on more top in setting out trees; would urge buyers to get more roots when purchasing trees.

George Bridges asked if was not best to prune heavy early in the season to get the most new wood on old trees.

A. T. Linderman would wait until the trees leaved out. Thought a good, healthy growth in the main limbs better than superfluous water sprouts; would avoid all extremes in pruning.

L. H. Bailey would recommend leaving on more top and applying more manure.

The president appointed John Williams to attend the convention of fruit shippers to be held at the Junction Wednesday, May 6th.

FRUIT ENEMIES AND FRUIT FRIENDS.

SOUTH HAVEN, May 12, 1874.

We confidently believe this is one of the most favored fruit regions in the Union, and frankly admit it equally favored for the development of insects, but are glad that insect destroyers, beetles, and parasitic enemies are also well protected so to hold in check the excess of insects injurious to fruit. For a full crop we must help destroy them or ward them off. The most destructive enemy to newly planted trees, especially on dry sand or gravelly soils, is the cut-worm, which eats the buds and foliage so as to destroy the function of the tree, which new growth is necessary to the well-being of young peach trees, especially newly transplanted trees, whose first effort is to restore the uneven balance of the tree caused by cutting off a portion of the roots in digging, then leaving on or taking off too much of the top. These cut-worms are best destroyed by placing chips on the ground at the base of the tree, under which the worms hide during the day, when they can be found and destroyed. The most successful method of keeping them from the tree is to wind a band of tin around the trunk. In the case of bearing peach trees they are removed from under the barks put at the base of the tree for the purpose of catching the curculio. The curculio lays eggs in the young fruit, which hatch out, and, while a worm, usually destroy the fruit. By placing chips, barks, or boards at the foot of the tree, early in the season, the greater part of the curculio can be destroyed, if the weather is favorable for them to fly, before the fruit is large enough to sting. The small beetle that lays eggs on the new shoots, which hatch out and eat the pith of the new wood, causing it to die back, are also found under the curculio traps. Lady bugs, tiger beetles, and golden carabus also resort to the chips to catch and eat the cut-worms, curculio, and twig-borers; these should not be destroyed in collecting the others.

The question of cultivation was again brought up, one contending that plowing orchards should be dispensed with and the cultivator used in its place; another thought a drag was sufficient, and another would substitute mulch. These are all in their place for different kinds of fruit which root different. Strawberries and raspberries, which root near the surface, can grow successfully if mulched; currants, gooseberries, and blackberries will do cultivated with a drag; grapes and quinces with a double-shovel cultivator; and for the following reasons peach trees should be cultivated deeper, the deeper the better. Deep cultivation induces the roots to go deeper, it warms and moistens the ground at a greater depth, which enables the trees to stand extremes of heat and cold, wet and drouth, and the severity of winter.

SOUTH HAVEN, May 18, 1874.

The meeting was called to order, the President, Norman Phillips, in the chair. In the absence of the Secretary, L. A. Randall was appointed Secretary *pro tem*.

Mr. D. B. Williams presented a newspaper article which was read, in which the correspondent recommended very highly the use of a solution of sulphate of iron (copperas) to increase the yield and size of fruit, and at the same time giving a better flavor. The past season its use had produced astonishing re-

sults in his pear crop; used on vegetables was valuable; mentioned beans especially, increasing their size and yield sixty-nine per cent. Manner of preparation and application: To one barrel of water add two and one-half pounds of the sulphate of iron,—the solution is then to be sprinkled upon the ground about the roots or plants. Mr. Williams said he had used this preparation in certain cases with very satisfactory results.

The President stated that he last fall packed a number of barrels of apples, first wrapping pieces of newspaper about each apple, in the way in which oranges and lemons are put up for shipment. He had just received for them, sold in Chicago, at the rate of \$9 per barrel, while others, equally as good, put up in the ordinary way, brought but \$5 and \$6 per barrel.

Messrs. Dyckman, Hurlbut, Williams, Sheffer, and others expressed their determination to use to some extent the "Windoes Curculio Remedy." At the next meeting opportunity will be given those desiring to buy the material for this purpose to unite and purchase a quantity, thereby getting it at reduced rates. Fruit men will please note this fact and be present.

BUGGING.

SOUTH HAVEN, May 25, 1874.

Some one recently, while speaking of the insufficiency of knowledge concerning fruit growing, said fruit culture was not a science. At one of our recent meetings we established the fact that for our guidance in pruning the branches of the tree were as essential to the perfect development of the tree as the roots, and the first effort of the tree was to restore the deficiency to preserve the balance; that while the roots furnished sap, the leaves and green parts were equally necessary to digest it; that excessive pruning of the roots or top was an injury; that the long limbs and roots should be shortened, and the numerous small ones thinned out; that bruised limbs, trunk, or roots should be cut smooth and covered to assist in healing; that pruning should be done when the tree is making the most new growth so as to more quickly heal the cut,—these facts are as well established as similar ones in the science of surgery.

At another meeting we ascertained that the codling moth and twig borer passed the winter here in the worm or chrysalis state, and as such can be easily destroyed. The last meeting was principally used in ascertaining the best remedy to preserve our trees from the climbing cut-worm, which crawls up the tree at night and eats the buds, green fruit, or foliage, descends in the morning and burrows in the ground or hides under chips, or anything to secrete it from its enemies. The conclusions arrived at were that the eggs are laid in August at or near the base of the tree, where they hatch, and before winter make about one-third of their growth by nightly eating the new growth of the tree. When severe weather comes on they burrow in the ground until spring, when they continue eating, growing and maturing until June, at which time they go into the ground and enclose themselves in a case, transform into a miller and emerge about the first of August, lay soon after, and then disappear. One member suggested to go out with a lantern at night and pick them off or shake them on a sheet. Another advised placing chips or barks at the foot of the tree for them to hide under, remove the chips during the day and destroy them. Another advised sowing oats or buckwheat to feed them. The most

effectual remedy recommended was to keep tins continually tacked around the trunk of the tree, so the worms cannot ascend, and keep the ground clean, so as to starve them out.

Bugging is the science of entomology that relates to fruit culture. In the study of birds which destroy our insect enemies we include ornithology; in the fertilization of flowers we include the science of botany; in the fertility of the soil, geology,—so that if pomology is not a separate science, it is a compound one.

Alfred Fitch inquired what kind of a bug it was he had found under his chip trap, resembling in shape the common curculio, but larger.

John Williams said it must be the apple curculio.

G. W. Griffin remarked that they were becoming frequent here. They resembled the apple curculio he had seen in Wisconsin.

A. S. Dyckmann said that the plum curculio, which was the pest of our peach orchards, were not as plenty as last season, doubtless on account of the thorough work he made last year in destroying them by the Ransom chip-trap process. He thought this the most effectual remedy, and where this failed in removing them he would use the sheets. He would not recommend the plan of Mr. Windoes, of driving them to other orchards with a tar smudge; any method short of killing them was radically wrong.

J. Lannin said he had discovered a large brown beetle in his plum trees, eating out the center of the new growth. The beetles are smaller than the May beetle, with a roundish, oblong body; they visit the trees at dusk, and burrow in the ground during the day. They can be found by observing the round holes they make in the ground.

Alfred Fitch suggested that hereafter insects and worms injurious to fruit tree or roots be brought into the meetings.

WHAT IS BUGGING?

SOUTH HAVEN, June 6, 1874.

A. S. Dyckman reported good success with the chip-trap in catching curculio. Caught 1,600 last Saturday, and nearly as many to-day,—Monday. Employed boys for the purpose of collecting them. Each boy carried a can for worms and a bottle for bugs. When through, the bugs were scalded and spread on a sheet to count, to ascertain which boy had done the best. Did not find as many twig-borer beetles or snap-bugs as last season.

B. H. Dyckman said he watched a small green worm eating a green cherry, and in less than an half hour he had eaten half of it. These worms are not found under the chips. When hatched, produce a small variegated miller, red and yellow.

W. H. Hurlbut said the tent caterpillars usually make a web in the crotch of two limbs, eating the foliage clean, and spreading the tent as they proceed. This season they spread over more surface, and he thought perhaps they were a different worm, as they worked more like the worm which appears later in the season. This is doubtless owing to the warm weather of late.

THE CULTIVATION OF THE PEACH.

SOUTH HAVEN, June 13, 1874.

T. T. Lyon said the tendency of the peach was to root near the surface of the ground, where it was warmest, and therefore he would not advise deep plowing, but would keep the surface mellow, well fertilized, and manured with composted manure. This was in harmony with his theory and former practice of low-heading trees, and heading in the long limbs to make a round low top. The only objection he could see to this plan here was the inconvenience in catching the curculio under the chip traps; in the use of sheets he could see no objections to low heads; they were an advantage in thinning, picking, and pruning; it shaded the trunk and ground, which was a benefit in drouth and extreme cold; they were not so liable to be blown by the wind, which sometimes injured the foliage and fruit.

O. C. Lathrop said he would secure good dry sandy loam, manure heavily, plant deep, cultivate deep, head high, flatten the top, shorten in, and thin out the wood and fruit. Thought by this method a peach orchard would last fifty years. By cultivating deep, the soil was made warm and moist, which protected the trees from drouth, and the depth of root braced the trees from the wind and preserved them from the cold in winter.

A. J. Pierce approved of much cultivation; it was as great a benefit to a peach tree as to a crop of corn; would avoid all extremes in peach culture.

THINNING FRUIT.

SOUTH HAVEN, June 20th, 1874.

The subject for discussion at the pomological meeting Monday evening was "The Best Method of Thinning Fruit," and was practically illustrated by A. S. Dyckman on limbs laden with peaches brought in for that purpose. He first removed one-third of the small limbs on the branch to allow the light and heat to reach the remaining ones, so as to give room to the proper development of the leaves, wood, and fruit. He next removed nine-tenths of the peaches, leaving them distributed over the limb so that no two peaches left were nearer than six inches of each other. On two, three, and four-year-old trees, having in the neighborhood of two, three, and four thousand peaches each, he would remove them so as to leave but two, three, and four hundred respectively. The tendency of the peach, he said, was to early overbear and ruin themselves for the future by enfeebling the vitality of the trees. By thoroughly thinning the wood and fruit, and adding sufficient fertilizers, and thorough cultivation, the trees would increase in size and productiveness.

L. H. Bailey said he was going to adopt the practice of thinning his apple orchard; he had commenced by thoroughly thinning the wood, and was going to thin the fruit by removing with a pair of shears two-thirds of the apples, leaving them well distributed over the tree. He hoped after getting rid of the codling moth, as Mr. Dyckman had of the curculio, to remove a larger portion of the fruit at this season of the year while it was small. He remarked at a previous meeting that it taxed the vitality of the tree as much to grow wormy apples as to mature perfect specimens, and the shedding of too much

fruit by some varieties of apples and pears showed that the over-blooming and setting of fruit was also a great tax on a tree, which could best be removed by increasing the wood growth of the tree by manuring, cultivating, and pruning. He cited some varieties of apples which overbore one year so as to have none the next, and on trees where he thinned one limb or one-half the tree, that portion bore the next. By thinning he could have large, handsome, high-flavored fruit every year. The only interference he had in carrying out his plan was the codling moth,—the best destruction of which was made the special discussion for the next meeting.

THE RUST.

SOUTH HAVEN, June 27, 1874.

Alfred Fitch brought in two bottles of bugs, among which were the apple curculio.

C. H. Wigglesworth thought that the rust in the raspberries and blackberries might be induced by planting on wet ground, which were liable to be heaved out in winter, as he had observed that those vines affected with the rust had comparatively few roots.

In answer to this, it was suggested that the rust, attacking the foliage, would lessen the need of roots and cause them to waste away. If the rust was developed in and conveyed with plants, and carried to neighboring plants by the wind or in contact with our clothes, it is desirable we should know it. He bought his plants first affected at South Bend, Indiana, and he had carefully cut them out and burned them. Its first indication is in a sickly yellow appearance, with mildewed spots on the under side of the leaves; afterwards the new shoots are fine and narrow, barren, and die out. He had seen none on the red raspberries.

President Phillips remarked that it was believed by some that the disease was conveyed to neighboring plants by the dust of the rust, and would recommend its removal as soon as seen.

THE YELLOWS.

SOUTH HAVEN, July 3, 1874.

A large attendance was present at the regular meeting of the Pomological Society, to ascertain what they could by comparing one another's experience in regard to the disease known as the yellows in the peach.

Mr. Cheesebro asked for a description of the yellows, to enable him to detect it in an orchard.

The secretary replied that the first appearance of the yellows was usually seen in the premature ripening (some two weeks in advance) of one or more peaches on the tree, which peaches were unusually high colored and spotted

with reddish spots. On opening the peach it will be found unusually red at the pit. The next appearance of the yellows is seen later in the season, of unnatural shoots pushing out on the limb having the spotted peaches. These little shoots are fine in growth, having small, narrow leaves of a pale green color. The following spring, tufts of small, wiry shoots appear near the base of the limb, or at the base of the tree on the side affected. The following season, usually, all the peaches on the limb first affected will prematurely ripen, and the adjoining tree will also be affected on the nearest side. Often several neighboring trees will have on scattering affected peaches. The following season the tree first affected is covered with spotted peaches and an increase of the small shoots and tufts in all parts of the tree. The following season the leaves on the tree turn yellow, and the tree gradually dies.

W. H. Hurlbut wished to know if there were any yellows in this vicinity.

The chairman of the committee which was appointed a year ago to examine the orchards in this section, and if any yellows were found to have the tree removed, said they found traces of it in several orchards, and where the owner of the orchard had assisted them had removed it. There were some traces of it still left. There were three cases of it where it had made its appearance in three different orchards, where by removing the trees as soon as the diseased peaches were discovered, all traces of it were obliterated. Other trees were set in their places and were growing finely.

The president remarked that since the peaches were unwholesome to eat, and the tree after its first attack unfit for anything but to spread the disease, he would recommend the members to be constantly on the lookout for it, and have it instantly removed, root and branch.

Messrs. Griffin, Philips, and Dyckman exhibited several varieties of cherries. One limb shown by Mr. Griffin had on a four-inch cluster, with fifty-two cherries on it.

At the next meeting the blight in the apple will be talked of.

THE APPLE-TREE BLIGHT.

SOUTH HAVEN, July 20, 1874.

Captain I. S. Bunnell of Covert opened a discussion at the pomological society meeting by laying on the table apple limbs from his orchard, which he thought affected by apple blight, and, at the request of the president, made a few remarks concerning the supposed blight. He said that we knew comparatively nothing of the fearful havoc this blight was making in other sections. He could see little or none here near the lake; but in his section whole orchards were affected. He was glad, however, that the dormant buds below the affected terminal shoots were growing out, and he hoped to see his trees again robed in living green. He said he had seen no more blighting since last Thursday. He thought the blight occurred only on clear, hot days.

Mr. Linderman said a correspondent of his in New York, where the blight was prevalent, assured him there were two species of apple blight,—one caused by insects and the other not; and for the blight not caused by insects he would recommend the use of salt sprinkled on the ground under the tree as a

preventive. Mr. L. thought the blight might be caused by the sudden changes of temperature from cold to hot, especially after a shower. C. H. Wigglesworth said in New Hampshire they used salt sea weed as a mulch for their trees, which was a great benefit to them, causing the apple trees to make a luxuriant growth.

Captain Bunnell said the blight commenced on the end of the limb, usually the terminal shoots, and in a few hours it will turn brown, continuing to die back a foot or two. Different cultivation made no difference, though he thought some varieties more liable to it than others.

W. H. Hurlbut differed with him. He could see no difference in different varieties, nor different thrift, farming, soil, or culture. He attributed it to insects. He had studied it carefully when it appeared seventeen years ago in his orchard at Bangor. He would recommend cutting off all the affected limbs at the first appearance of it, cutting off all this year's growth from the affected limb.

Alfred Fitch had found a small worm at the commencement of this year's growth on a limb beginning to blight.

W. H. Hurlbut said the blight generally occurred after the worm had left.

The secretary made a careful examination of the limbs brought in—one from a Golden Russet tree, one from a Greening, and one from a Transcendent crab, and in all, at the commencement of this year's growth, a small hole was found through which a worm had crawled out, and on cutting open the wood a small discolored hole was found in the pith of the limb. It was suggested that a blighting of the limb would cause a shrinking in the pith; but limbs subjected to an oven temperature of 160 degrees turned brown in a few minutes, but produced no holes in the pith, which is quite hard and firm at this season of the year. The probabilities are that an insect lays an egg in the terminal bud early in the spring, which hatches out and eats the pith during the growth of the shoot. When the worm completes its growth it eats out and falls to the ground to transform into the winged state. The worm, in coming out of the limb, lets the air into the cavity, which causes it to discolor, decompose, and check the circulation of sap, which in bright, clear, warm days causes the limb to blight. There may be blight in the apple similar to pear blight or frozen-sap blight, but we have not seen it yet.

Master L. H. Bailey showed a jar of fall web worm on an apple leaf.

THE YELLOWS.

SOUTH HAVEN, Aug. 22, 1874.

A large attendance was present at the Pomological Hall Monday evening. The table was graced with eleven plates of apples and pears from T. T. Lyon's orchard, at Plymouth. Special attention was called to the Garden Royal apple and Sterling pear, which Mr. Lyon said were very valuable varieties of fruit, and would command a high price in market when known. He would recommend care in growing, thinning and picking, packing and labeling new and choice varieties of fruit, which would improve the standard and price.

The Committee on Yellows made the following report :

Your committee, who were appointed to examine the peaches in this vicinity to see if any yellows could be found, and if so, to have them removed, beg leave to report: That where traces of it were found one and two years ago, and then removed, none now can be found; and where new trees are set in their places, they are growing finely, and to all appearances healthy. In one case two years ago the owner tried to cut it out of the tree by cutting off the affected limb, but last season he found that and three adjoining trees affected. These were carefully removed, and no traces of the disease can now be found in his orchard. A similar case was found last season, where two peaches were found diseased on the end of a limb, which limb was removed as soon as the peaches were discovered to be diseased. On a recent examination, this tree was found to be covered with diseased peaches, and several other trees in the neighborhood were likewise found affected, in whole or in part, which have all been removed. Your committee found one case where the yellows originated from the burning of a house two years ago, which destroyed one side of the tree. The following season tufts of small wiry shoots came out on the line dividing the burned and green wood, and all the peaches on the tree were spotted a month before the usual time of ripening, and the peaches on the nearest tree were affected with the yellows, about three-fourths of them, though no tufts or diseased shoots could be found until after the fruit ripened, at which time the trees were removed, and with their removal all traces of the yellows disappeared. A case less positive occurred in one of our orchards by the burning of a stump in June, which was followed by the appearance of the yellows the same season.

Your committee are undecided as to whether the yellows are originated by the peach tree borer more or less girdling the tree just below the surface of the ground, overbearing, neglected pruning, the want of cultivation or manure, or trees standing in grass. One or two cases of the yellows may have originated from a combination of these causes. Great care should be exercised in increasing the vitality of the peach by selecting strong healthy trees and taking care of them. We found numerous cases of budded yellows, where diseased buds were used. The vitality of the stock or root covers the disease until the tree comes into bearing, when it is seen in the premature reddening of the fruit and yellowing of the new wood and leaves. In the case of budded yellows, all the fruit is simultaneously affected; whereas, in fertilized yellows, or blossoms fertilized from the pollen of diseased trees, only those identical peaches are affected. We experienced no difficulty in fertilizing a healthy tree with diseased pollen, when we ascertained that the pollen grains on a diseased tree were more forward than on a healthy tree, and less time could be used in using it. This accounts for the fact that a diseased tree does not always affect all the trees in its neighborhood, nor all the fruit on the same tree or limb. For this reason the almond is less liable to the attack of the yellows than the nectarine, because it does not bloom simultaneously with the peach. On account of its great hardihood, thrift, and adaptability to different soils and exemptions from the borer and splitting of the limb, to increase the vitality of the peach, we would recommend the use of the almond for stocks for peach trees. As far as using diseased pits are concerned, your committee so far have failed to make them grow. Buds from diseased trees grow readily.

Your committee are pleased to report that the owners of orchards readily concur in the view taken by us, and willingly consent to the removal of diseased trees and destruction of the unwholesome fruit, so that we are happy to say *no yellows can be found in our orchards*, and to completely eradicate it should any occur in our late maturing varieties, one or more examinations should be made later in the season.

H. E. BIDWELL,
H. LINDERMAN,
JOHN WILLIAMS,
Committee.

SOUTH HAVEN, Sept. 12th, 1874.

The secretary was called upon to report the progress of the premium lists, which he stated would be ready for distribution at the next meeting. The president stated that the time for holding the fair was chosen to be October 1st and 2d, and he believed all would assist in making it a success.

Mr. Brunson of Benton Harbor being present, was called upon to give his views concerning the spread of the yellows at his place and St. Joseph. He said the yellows first appeared there five years ago, and on account of its not being cut out then some twenty of the largest, oldest, and best orchards had to be all destroyed last winter, and the rest would have to go unless they adopted our plan of instant removal of any trees found affected. His views

concerning its spread through the pollen and by budding were similar to those of our committee.

Mr. Bull of Detroit said he was glad fruit was so abundant here, and wished it was more plenty and cheaper at his place. He paid there seventy-five cents per basket, and in St. Joseph fifty cents, the difference in price being made by express charges and commission. He remarked that Mr. Engle of Paw Paw, in the eastern part of this county, gets the first Michigan fruit in market, while we market each variety of our fruit later than Benton Harbor, twenty-five miles south, and Saugatuck twenty-five miles north of us,—thus showing that the lake produces the greatest effect on our orchards.

Considerable discussion arose as to which variety of peaches was best for market. The choice was contended for by the Early Crawford, Jacques' Rare-ripe and Old Mixon,—each of which had strong adherents. None defended the Barnard. Some Cooper's Mammoth peaches were placed on the table by D. B. Williams, which were so similar to the Crawford that taste could not distinguish them.

A box of beautiful Beurre Clairgean (pronounced *Klairzho*) and fine Beurre Bosc pears were sent in by Mr. Windoes of Kalamazoo,—also a greenish-looking apple, the name of which was unknown to those present. They were preserved for a future meeting, and when in good eating order their quality will be discussed. A large apple was placed on the table by Mr. Cook, which was pronounced to be the Flower of Genesee, the quality of which was fair,—not first-rate. Some Old Mixon peaches were brought in by President Phillips. This is a large, handsome peach, of fair quality, with a tough skin which fits it for transportation.

SOUTH HAVEN, Sept. 26th, 1874.

A fine display of Agawam grapes was made by Mr. Cook of Casco; also Dearborn Seedling, Seckel and Stevens' Genesee pears. A box of Kalamazoo and Allen's Hybrid grapes were sent in by P. C. Davis of Kalamazoo, and a basket of Croton, Eumelan, and Iona grapes by the Secretary, the merits of which will be spoken of in a future report. Mr. Cook also exhibited a desirable peach, for name, which was doubtless a seedling worth looking after. It is to be hoped that our coming exhibition will develop some new and desirable varieties of fruit to take the place of some of those we are now growing which ought to be replaced by something better.

SOUTH HAVEN POMOLOGICAL FAIR.

SOUTH HAVEN, Oct. 10th, 1874.

The third annual fair of the South Haven Pomological Society was held on Thursday and Friday, October 2d and 3d. As usual, there was a large display of fruits, vegetables, grains, house plants, flowers, articles of domestic manufacture, and the fine arts. The quality could not be excelled. The exhibitors were from Deerfield, Casco, Ganges, Arlington, Pine Grove, Bangor, and South Haven.

William H. Gregory of Pine Grove exhibited 200 specimens from his farm,

of different varieties of fruit,—fresh, canned, and dried,—vegetables, grains, and articles of domestic manufacture, all the production of himself and family.

Samuel Hoppin of Arlington made apples a specialty, and exhibited all of the best varieties. H. E. Bidwell exhibited honey and a growing crop of figs. T. A. Bixby of South Haven, from his forty acres of fruit, exhibited all the best varieties of fruits now in season, making an excellent display. All of the exhibitors invariably brought none but first-rate articles, and every one was pleased with the exhibition.

The South Haven Pomological society was organized five years ago, and Norman Phillips has presided as president at the meeting of the society every Monday evening since its organization. While other societies of a similar kind have had their rise and fall, this society has continued harmonious and greatly to the benefit of all fruit growers who read and hear these weekly discussions on fruit growing by these close observers who make pomology a specialty.

THE BEST PEACHES FOR MARKET.

SOUTH HAVEN, Oct. 17, 1874.

The Pomological Society at its last meeting had another discussion as to the best varieties of peaches for market culture, and the best times for setting trees.

Mr. Blackmore said he chose the Barnard for his use.

H. Chatfield preferred Crawford Early and Late, Old Mixon, Jacques' Rare-ripe, and Stanley Late. Was going to set this fall.

Geo. Griffin spoke in favor of Hale's Early, Wheeler's Early, Barnard's and Stanley's Late. Would set trees in the fall.

C. H. Wigglesworth would set Hale's Early; didn't know about Wheeler's Early; something is needed to fill in between Hale's Early and Crawford's Early. The Barnard, such a year as this, should be discarded, it not selling well when there was a glut in the market as there was this season. He liked Old Mixon, Jacques' Rareripe, Late Crawford, and Stanley's Late, on heavy soil. The Old Mixon stood the highest this year in Chicago market, and was very popular; thought a person would be perfectly safe to set in fall on high ground, and then bank them up; should set as early in the fall as they could be taken up from the nursery.

Daniel Pierce recommended the Yellow Alberge, Barnard, Early Crawford, Jacques' Rareripe, and Stanley. The Smock's Free is too late for this locality. I like the Old Mixon well; they bear well, and come in after the Barnard. I would not put out any later than the Stanley. The Delevan is later than the Stanley.

Mr. Cheesebro said A. T. Linderman recommended the Hale, Early Crawford, Jacques' Rareripe, Late Crawford, and Hill's Chili (Stanley Late). The society seemed to think the Wheeler's Early the only peach that came in between the Hale's Early and the Crawford's Early.

Mr. Lathrop spoke favorably of the Hale's Early; said it was the most profitable peach to him; thought it was an excellent peach for canning; it was so sweet, though, it mussed up more than some other kinds in the can; liked the Barnard better than Crawford Early, and thought a great deal of the Old Mixon and Stanley Late; would not set anything later than the Stanley for

market purposes. On being asked what he would set if going to plant an orchard of a thousand trees, he gave the following list for market purposes: Hale's Early, 100; Crawford's Early, 100; Barnard, 150; Jacques' Rareripe, 150; Old Mixon, 300; and Stanley Late, 200.

SOUTH HAVEN, Oct. 24, 1874.

The subject for discussion at the last regular weekly meeting of the society was, "What varieties of peaches shall we set, and when?"

T. T. Lyon said that on suitable soil early fall planting was preferable to spring. The trees set then repaired the damage done in digging, and were ready to make an early and vigorous growth the following spring. As far as practicable he would at least procure the trees in the fall and heel them in a sheltered spot, in dry soil. As to the selection of varieties he would choose a succession, and for trial would recommend a few of the Early Beatrice. At present he would set a fair proportion of Hale's Early, Early Crawford, Barnard (Foster, a few for trial), Jacques' Rareripe, Late Crawford, Hill's Chili, and a few Smocks.

A. J. Pierce would discard the Barnard and plant mostly of the Early Crawfords, Old Mixon, and Jacques' Rareripe.

D. C. Loveday said if a man was following mixed farming he would avoid early peaches and plant none earlier than Snow's Orange. He thought highly of Old Mixon, Jacques' Rareripe, and Hill's Chili.

T. T. Lyon remarked that the Snow's Orange was earlier and better than the Barnard.

L. H. Bailey said his choice was Early and Late Crawfords and Old Mixons, of which he was going to set largely this fall.

C. H. Wigglesworth thought the Barnard ought not to be discarded for the Early Crawford. It was hardier and more forward in bearing. He was going to set a quantity of Hale's Early, Large Early York, Barnard, Early and Late Crawford, Hill's Chili, and Old Mixon.

D. T. Pierce also spoke highly of the Barnard peach. When thinned he thought they were equal to the Early Crawford.

D. B. Williams said his choice would be Early and Late Crawfords and Old Mixon. He would recommend the Delevan peach and discard Scate, Early York, and Honest John. Would plant in the fall in dry ground and hill up.

A. S. Dyckman had set mostly in the spring, with good success. He said the Barnard needed the highest cultivation and the most thinning, and then it was one of the best of peaches. His Barnards have borne four baskets to his Crawfords one. He thought the Mountain Rose would displace Wheeler's Early and Cole's Early Red; he would not set Delevan, Keyport White, nor Smock. Last year his Early Crawfords brought the most; this and year before last his Hale's Early paid the best. He would not plant less than eighteen feet apart.

PLUMS AND QUINCES.

SOUTH HAVEN, Oct. 31, 1874.

In regard to the profitableness of plums and quinces, T. T. Lyon said he could see no reason why quinces would not be profitable grown on a more

extensive scale: they succeeded well in our gardens, why not as an orchard fruit? They could be dried or canned and made to pay, on a large scale. We have a suitable soil and climate. In reference to plums, they required more care to keep off the curculio, but if we would set out more trees, and give them sufficient care, they would be very profitable, as they were very productive and brought a comparatively high price: they were inclined to overbear, and should be thinned. He thought a systematic shortening of the new shoots on young trees, and a thinning out of the superfluous branches on old trees, would prevent any injury from overbearing. The plum preferred a heavy soil, rich and moist, but not wet. The Lombard and Princess Yellow Gage does well on sand.

C. T. Bryant said that he was simply experimenting in his present effort to grow a plum orchard; had no experience in growing quinces.

D. B. Williams said the quince did well on a clay sub-soil; he thought large orchards would not be profitable, as people only wanted a few to use; they were very profitable at present; he thought salt good for plums and quinces; he knew of their flourishing on the sea coast where the salt spray frequently covered them.

T. T. Lyon thought caution necessary in salting trees.

L. H. Bailey had no faith in coal tar for getting rid of the curculio on plum trees; he had tried it thoroughly this spring, with no success; he has succeeded well with quinces, but did not cultivate them; mulched heavily with manure; he thought there was more money in peaches.

W. H. Hurlbut has done well with quinces, but not with plums.

D. C. Loveday said he used the Ransom chip-trap process for getting rid of the curculio on his plum trees, and followed it with the use of sheets, and was repaid with good crops of sound plums; they netted him five dollars per bushel; had in bearing Washington, Yellow Gage, and Damson.

GOOSEBERRIES AND CURRANTS.

SOUTH HAVEN, Nov. 14, 1874.

C. T. Bryant said, in regard to the cultivation of gooseberries and currants, that they flourished with comparative neglect; cheap labor would grow them, and cheap packages would carry them to market, and they ought to pay.

John Williams said that English gooseberries, as far as he had observed, did not pay. He thought the late varieties of currants were profitable, especially the Victoria. He had watched the market for several years, with a view of planting extensively, and would only grow the early varieties to dry.

T. T. Lyon remarked that, grown as they usually are, with neglect, they were not profitable; but if cultivated, pruned, and cared for, they would pay. Some objection was raised on account of the birds eating a few; he would raise them all the more on that account, to encourage the birds to collect them and remain in the orchard, where they would destroy many injurious insects and worms. The striped fruited variety was later than the Victoria, but smaller and sourer. The earlier varieties might be kept late by covering the bushes with cheap paper bags. Currants might be set between rows of young

trees and occupy but little room. No wood older than two years should be left on the bushes. He spoke highly of the Downing's Seedling gooseberry, and favorably of the Mountain Seedling, as good bearers and free from mildew.

Henry Chatfield said currants and gooseberries were fruit he would not like to do without, and he could sell at a fair price all he had to spare. He raised the White Grape currant and Houghton Seedling gooseberries.

Chas. Wigglesworth said there was no demand for them in Chicago; they were grown all over the West. They filled no gap between strawberries and raspberries. Triumph de Gand strawberries and Kirtland raspberries followed each other and paid twice the money.

D. E. Histed said the black currant paid well; they required moist land; birds and currant worms would not touch them.

Mr. Cook brought in large specimens of King apples, and the secretary Smock peaches.

IS PEACH GROWING OVERDONE?

SOUTH HAVEN, Nov. 21, 1874.

The question for discussion Monday evening, "Is peach growing overdone," was the most important subject ever brought before the society. Notwithstanding it rained hard, several came a long way on foot to hear what was said, pro and con, by those most interested in the future welfare of our most important business. Space will not permit a full report of the remarks made by all, and I will only touch on the most important points. I might preface by saying that all were unanimous that the market for first-class peaches could not be overstocked by us, even if every available acre which we could clear of stumps were set to fruit. It was generally conceded that the market for first-class peaches never was overstocked, and in all probability never would be; that the price of them in seasons of greatest abundance had always been remunerative, and in seasons of scarcity were very profitable. It was admitted that the growing of inferior fruit was only profitable in years of scarcity, and the price then realized for them only repaid for the loss attending them in years of abundance; and on account of the damage done in breeding curculios and borers, neglected orchards were an injury to us and ought to be abated. It was estimated that the number of trees already set in this vicinity was about 100,000; that there would be set in the spring some 50,000 more, and in the next five to ten years it might reach a million. This, in all probability, would not supply the increasing demand for peaches. The advantage of growing them extensively was in reducing their cost, which, it was calculated, could be done at one-half the price now attending the raising of them. The cost of baskets, freight and commission could also be much reduced. It was also suggested that a drying factory here would save a large waste.

SOUTH HAVEN, Nov. 28, 1874.

The question for discussion at the last regular meeting of the society was a continuation of the question of the previous meeting, "Is peach culture overdone?" In a locality like this, which has never missed a crop since the trees first came into bearing, nineteen years ago, and with our unlimited market in every direction, makes its own answer, emphatically no; and in astonishment

we pause to inquire why the question was ever asked. The reply comes back to us from the State of New York, saying that their trees or fruit buds frequently fail; if they do not they get so large a crop that the fruit is small and does not bring remunerative prices. One of the principal peach growers in Delaware said last fall that a full crop of fruit in that State was an exception. Having five million bearing trees scattered over the entire State, such is the case that but a portion of the State has a crop, the failure sometimes arising from a premature swelling and weakening of the buds, so that a moderate cold spell, which comes in streaks, will kill them, as will also late spring frosts after the trees bloom or the fruit is set.

Such a case never happened here; the only loss we have experienced has been in a few trees in exposed localities, which were frozen in the root by the bursting of the root cells during a cold, windy spell of weather winter before last. One thought this did not account for the loss of his trees, which were set in a low, wet place, and the roots covered deep with sand. The quantity of moisture there caused the soil to freeze deep. This suggests the careful setting of trees, more than any fault in the climate. A little mulch for dry knolls or a drain for wet places will remedy the evil.

BEST CONDITION OF TREES FOR WINTER.

SOUTH HAVEN, Dec. 7, 1874.

In regard to the best condition of trees for winter, Geo. L. Seaver said the top and roots should be thoroughly ripened in the fall, all bruised and split limbs should be carefully removed and the cut surfaces protected with paint or anything to prevent excessive evaporation. The grubs should be removed from the roots, and care be taken in cutting them out to destroy as few perpendicular lines of bark as possible. The cavity made by the borer should be all cut out and the edges made smooth with a sharp knife to assist the tree in healing them up. The trees should then be banked up about six inches and the ground be left sloping from the trunk.

D. C. Loveday thought more care should be taken in ripening the wood of the tree. This was best done by thoroughly draining the land and keeping the top of the tree well thinned out, thus permitting the heat, light and moisture to mature the wood.

C. T. Bryant thought clean culture assisted in ripening the tree, and after the wood and buds were well ripened, he would stop cultivation of the soil, but would hoe off or pull any weeds appearing later in exposed places; would mulch the ground with coarse litter.

SOUTH HAVEN, Dec. 14, 1874.

A good attendance was early present at the meeting of the Pomological Society, including members from a distance and several strangers from abroad. The time for holding an annual festival was set for the first Monday evening in January, at Monroe's Hall, at which time it is expected that the newly elected President will deliver his inaugural address; also several addresses will be read by members chosen for the occasion.

The question being disposed of, Mr. Gregory, of Kendall, inquired as to the probable cause of his winter apples rotting to an unusual extent thus early in the season.

D. C. Loveday suggested that the apples may have over-ripened on the trees before gathering, during the very warm weather in the middle of October. He had picked his the first of October and placed them in a cool store-room until severe weather came on, when he removed them to his cellar, where they were keeping in excellent condition.

Mr. Chatfield remarked that he gathered his the 10th of October, placing them in a cool loft until November, when they were removed to his cellar, and examination made to-day showed they were keeping well. He thought, back from the lake, apples ought to be gathered earlier. Mr. Gregory inquired what varieties, if any, were less exempt from the codling moth than others.

D. C. Loveday said his Russets and Jonathans were freest, and his King and Black Detroit most wormy. The Canada Red was added to the list of apples less stung, and the Maiden's Blush to those most affected. The exemption was attributed to the size of the calix when young, which was more or less open in different varieties.

The question chosen for discussion at the next meeting is: "What are the most profitable varieties of apples."

VARIETIES OF APPLES.

SOUTH HAVEN, Dec. 21, 1874.

The regular discussion of the evening was opened by the secretary, who stated that although the Baldwin and Greening were the leading market apples, they could be replaced by something better, as both had well known defects. He stated that in company with W. H. Gregory, of Kendall, they became acquainted with E. Buel, of Kalamazoo, who stated that he, in company with his brother, set an orchard of apples some fifteen years ago at Little Prairie Ronde. The orchard consisted principally of Canada Red, Baldwin, King, and an assortment of other varieties. His preference was decidedly in favor of the Canada Red as the best and most profitable market apple, remarking that had the orchard been all Canada Red it would net them \$1,000 more annually. They sold readily in Chicago for \$3 per barrel, while other varieties sold at considerably less. The usual objection was raised to the Canada Red of its being a slow grower, when Mr. B. stated that when top grafted on two year old Spy stocks it was equal to the average of other varieties. We were convinced of this on examining a six year old orchard of his, whip grafted two and a half feet high on Spy stocks, which was, all things considered, the finest orchard we had ever seen.

T. T. Lyon was next called upon for his views. He said as far as his nursery interests were concerned he would rather think a more thrifty growing money tree would be the most popular; still the Red Canada was his favorite; it was less liable to drop, less liable to be stung, and more uniform in bearing than any other apple.

H. Chatfield said he had no experience with the Red Canada. Former years

his Baldwins and Greenings were the most profitable; this year his Esopus Spitzenburgs were best.

L. H. Bailey remarked that age improved them.

Hiram Griffin said he had the Red Canada, but it was not in bearing sufficiently to judge of its value; he found but one stung.

L. H. Bailey said his Baldwins did best; he noticed the Stark and Lawyer were well recommended south.

T. T. Lyon said that apples of southern origin, although they might be No. 1 there, and highly spoken of, were No. 2 here, compared to our varieties. It was time that they had proved hardy, which hardiness was as necessary for them to endure the cold of our winter as the heat of their summer; still they were not as desirable for us as our own first-class apples. Mr. Lyon was asked if the green and yellow Newtown Pippin succeeded here, and he replied in the negative. On being asked as to the season of the Norton Melon, he said late autumn and early winter.

J. H. Cowley said his father top-grafted his large orchard in Oakland county to Canada Red; he would not have any other variety.

H. Chatfield thought the Red Canada might not succeed here, especially on our lightest soil.

T. T. Lyon said it would succeed on suitable soil; light sand was better suited to peaches and grapes.

L. H. Bailey said he lost confidence in Red Canada while in Detroit last winter, where he saw several shipments from St. Johns of small scabby Red Canadas. They were doubtless from off drift sand.

Chas. Gibson remarked that he thought apples might be grown profitably on sand by hauling clay and gravel from the beach and putting around them.

A. T. Linderman spoke highly of the Shiawassee Beauty as one of the best late autumn and early winter varieties.

J. Bonham was asked what variety of apples brought the best market price in Chicago; he replied the Red Canada. Greenings were now selling for \$2 50, Baldwins for \$2 75, Canadas for \$3 00 and \$3 50.

President Phillips said his Baldwins, assorted and wrapped in papers, brought last spring \$9 00.

SUBJECTS FOR DISCUSSION—LIST OF VARIETIES OF FRUIT FOR PROFIT —THE CENTENNIAL EXHIBITION.

SOUTH HAVEN, January 9, 1875.

The society was called to order by the president. The secretary read a letter from J. P. Thompson, secretary of the State Pomological Society, requesting us to make an estimate of the quantity and value of land set to fruit in Van Buren county; the yield and price of fruit in 1874, compared to 1872-3; the proportionate loss of trees, if any, in 1873. These separate points were freely discussed by all present, and figures taken for future reference. The secretary was instructed to correspond with all the principal fruit growers in the county, for the purpose of collecting facts for presentation at the Lansing meeting.

The committee who were selected to revise the list of subjects for discussion on the first Monday evening in each month presented the following :

For January.—Selection of Varieties for Planting.
February.—Spring Pruning and Destruction of Insects.
March.—Packages, Packing and Transportation.
April.—Preparation for Spring Planting ; Encouragement of Birds.
May.—Blossoming and Setting of Fruit, and Cultivation.
June.—Thinning and Pruning.
July.—Composition of Soils ; Drainage ; Mulch and Irrigation.
August.—Development of Fruit and Wood.
September.—Ripening of Fruit and Wood.
October.—Picking, Packing, and Preserving Fruit.
November.—Pruning and Mulching in Preparation for Winter.
December.—Varieties of Winter Fruit.

Which list was adopted by the society, and the committee further instructed to prepare a list of persons to open the discussion. As the subject for January to be discussed must be presented at the next meeting, a list of varieties of fruit for profit was prepared for Van Buren and Allegan counties :

Apples.—Maiden's Blush, Baldwin, Greening, Spy, and Red Canada.
Pears.—Bartlett and Beurre d'Anjou.
Peaches.—Hale, Early Crawford, Early Barnard, Jacques' Rareripec, Old Mixon, and Hill's Chili.
Quinces.—Orange and Rea's Mammoth.
Plums.—Lombard, Bradshaw, Coe's Golden Drop, and Bavay's Green Gage.
Apricots.—Golden and Peach.
Nectarines.—Early Violet, Elruge Red Roman.
Figs.—White Marseilles.
Cherries.—Early Purple Guinne, and Rockport Black Tartarian.
Gooseberries.—Houghton and Mountain Seedling.
Currants.—Red Dutch, Cherry, and Victoria.
Grapes.—Delaware and Concord.
Blackberries.—Lawton and Kittatiny.
Raspberries.—Mammoth Cluster, Clark, Philadelphia, and Herstine.
Straubberries.—Wilson and Triomph de Gand.

On motion T. T. Lyon was appointed to open the discussion on the varieties of Apples ; Harvey Linderman, on Peaches ; C. T. Bryant, on Pears, Plums, Quinces, Apricots, Nectarines, Figs, and Cherries ; C. H. Wigglesworth, on Small Fruits.

The secretary then read the letter from the Director General of the Centennial Exposition, inviting us to make an exhibition at Philadelphia in the summer of 1876 ; requesting us to elect such space as we thought we would need. The secretary recommended that the exhibition, if made, be made in glass cases, two feet square, for the better preservation, protection, and labeling of the fruit ; that only a few of the leading varieties be shown, and these to be perfect in every respect. That a case be made for apples, one for pears, one for peaches, and one for other varieties of large fruit, and one for small fruits ; one case for canned fruits, one for dried fruits, one for insects, one for birds, one for wood, one for the pressed leaves and another for the pressed blossoms of the different leading varieties of fruit ; and, inasmuch as we had no botanist for the preparation and arrangement of blossoms and leaves, the secretary moved that Woodford Law be chosen botanist for our society, which was carried.

C. J. Monroe moved that the society elect ten feet square of space for exhibition at the Centennial Exposition.

C. H. Wigglesworth thought that the exhibition should be made in the name of the society.

The president, vice-president, and treasurer remarked that if we made an exhibition, the society, county and State, would receive due credit for the same.

On calling for the ayes and nays, the election of space was carried unanimously.

OPPOSITION TO CONSOLIDATION OF REPORTS.

SOUTH HAVEN, Jan. 16, 1875.

Preambles and a resolution were then read opposing the consolidation of the State Agricultural and Pomological Reports, recommended by the Governor in his recent message, which were unanimously adopted by the society, and referred to the committee appointed to attend the Lansing meeting, as follows:

WHEREAS, The annual Report of Transactions of the Michigan State Pomological Society have come to exert a wide and beneficial influence, both within and without the State; and by the high quality of the matter they contain, are doing very much to elevate the standard of fruit culture among us, as well as to develop abroad a knowledge of our capacities in this respect, and thus to invite the development of this capacity by the introduction of foreign capital; and,

WHEREAS, We are fully convinced that such result has been, to a very considerable extent, due to the fact that the preparation of this report has been strictly in the hands of persons conversant with the peculiar wants of fruit culture, and confined solely to that interest; in consequence of which these volumes have, very largely, gone into the hands of persons needing them, and qualified to appreciate them; therefore,

Resolved, By the South Haven Pomological Society, that we observe with regret, that the Governor, in his recent message, has recommended the consolidation of the Transactions of the State Pomological Society with those of the State Board of Agriculture, for the reason, among others, that the number of copies published is, even under present arrangements, by no means adequate to supply the wants of citizens of the State, directly interested in the culture of fruits; and that the combining of the two in one volume, must result in the placing of at least the Pomological Report in the hands of large numbers of persons whose business and pursuits are strictly agricultural, and who, therefore, will care little for pomological matters; while the many interested directly in fruit culture, and who now find it difficult, if not impossible, to secure copies of the Pomological Report, will then experience still greater difficulty in doing so, on account of their absorption by distribution to agriculturists and others interested in neither pursuit, while the increased size of such consolidated volume must necessarily render it unwieldy, and at the same time add considerably to the expense of publication in securing an equal degree of publicity.

RECORD OF TEMPERATURE.

LANSING, Mich., February 12, 1875.

FRIEND BIDWELL:—Will you, as a representative of your pomological society, give me any information you may possess or can obtain upon the following questions:

First—Have you any exact record of differing temperatures with differences in altitude during any term of depression of the thermometer?

Second—Please give me, in short, the prevailing theory of atmospheric

drainage in your society, and the modifying influences in connection therewith.

Third—Have you any statistics from other localities bearing upon this point, and upon which you base theory of comparative protection varying with altitude? I am anxious to get at something definite in this direction: we lack accurate statistics.

Very truly,

CHAS. W. GARFIELD.

REPLY.

SOUTH HAVEN, Mich., February 20, 1875.

DEAR SIR:—In reply to your letter of inquiry as to our record of temperature, I would say it is difficult to give any exact figures unless you take into account the varying differences of the temperature of the air and water, which are constantly altered by the heat of the sun, which would require an averaging of our records to cover these variances, which would give us with the temperature of the air on the western shore of Lake Michigan, at the water's surface, 30° below zero: on the eastern shore, here, it would indicate about zero. At 100 feet altitude on the western shore at the same time it will indicate 26° below, and on this side, at the same elevation (100 feet), 12° below. At 200 feet elevation on the other side, 20° below, and at that altitude here 20° below. So that on our shore, with a cold wind from Wisconsin, it is warmer near the level of the lake. Thirty to forty miles inland on a level surface the temperature at the same time will indicate 15° below zero; at 100 feet elevation, 12° below; at 200 feet elevation, 5° below, receiving an average benefit in crossing the lake of 10 degrees; and since the winter cold comes from the west principally, I might say that the Lower Peninsula of Michigan is 10 degrees warmer in winter than Wisconsin. In a calm, with good atmospheric drainage, the temperature on the level of the lake indicating zero will give a record, at 100 feet elevation, of 8° above zero, and at 200 feet 20° above. So that in a calm which frequently follows a storm, our average altitude of 60 feet, with perfect air drainage, protects the fruit in winter and prevents any occurrence of frosts in summer.

H. E. BIDWELL.

FRUIT PACKAGES.

SOUTH HAVEN, March 6, 1875.

The regular weekly meeting was opened by the president calling attention to the fact that the State Pomological Society desired each local society to carefully prepare a list of fruits adapted to its locality, for the purpose of revising the list for Michigan, which was in process of preparation for publication by the American Pomological Society.

A committee of four were appointed to prepare a list for the society. The committee were N. Phillips, H. E. Bidwell, Geo. L. Seaver, and A. S. Dyckman.

The secretary informed the society that the box of books kindly sent by the Secretary of State for their library had been received. Whereupon a vote of thanks was tendered him for the same.

A box of Reports was also received by the secretary from the State Pomological Society, for which the society return their sincere thanks.

A box of Reports was also received from E. Buell, of Kalamazoo, and a vote of thanks was tendered him for the gift and for his former contribution of apples.

The librarian was also requested to procure a book, and make therein an inventory of the books and papers on hand,—crediting all contributions received and charging the members with those drawn out.

The question for the meeting ("Fruit Packages") being called, John Williams was requested to open the discussion, which he did by calling attention to a new paper berry box, which was very neat and cheap,—\$6 per 1,000 in the flat. There seemed to be a difference of opinion as to whether they were preferable to wood.

Inquiry was made as to the price of wood boxes in the flat, which were reported at \$5 per 1,000.

It was suggested that we had a new box and basket factory here that needed encouragement in starting. A motion was made and passed that the members of this society encourage as much as possible all home enterprises.

The president inquired if the members had practiced shipping early apples in baskets.

C. D. Loveday replied that he had shipped a large quantity of Red Astrachan apples in baskets which netted him \$1 40 per bushel. At a later period they paid little or nothing except in barrels. He remarked if fruit was high and scarce it would pay to ship in baskets, otherwise not.

N. Q. Munger, of Casco, exhibited a dwarf pear tree which died last summer, he thought from the inability to supply moisture to the top from the roots. This was evident from the amount of top compared to the root. He further stated that the soil was a heavy clay, and that it failed at the time of the drouth, and that the tree was unusually heavily laden with fruit.

D. B. Williams said that the quince roots on which the pear was grown to dwarf it for the purpose of inducing early bearing, were comparatively short, and needed manure and moisture nearer the tree than standards.

T. T. Lyon said that the fruiting of dwarf pears required a large amount of time and careful attention to persistently thin and regularly prune the trees, and without it they would not prove successful; he recommended to set the trees below the junction of the pear and quince to induce pear roots.

N. Q. Munger inquired if, on the failure of the quince root, would not the quince stump decay and prove an injury to the tree?

President Lyon thought not, if the pear root started before the quince root died.

The secretary thought that growing quinces from cuttings was an injury to quince and dwarf pear culture.

On motion, the question for the next meeting was chosen to be "Packing Fruit," and L. H. Bailey was chosen to open the discussion.

THE YELLOWS.

The following memorial was unanimously adopted at the regular meeting, held February 1st, 1875:

To the Honorable Legislature of the State of Michigan :

The disease known as the "Yellows" in the peach has made its appearance in our orchards, by nursery trees having been received from sections affected with the Yellows, which trees first show the disease in the premature ripening of the entire first crop of peaches some two weeks in advance of the other trees of the same variety; the diseased peaches becoming unusually red, especially at the pit, and acquire an insipid and unwholesome taste as they approach maturity. If the diseased trees are allowed to remain, the neighboring trees become affected, and in a few years the entire orchard becomes diseased, the trees developing weak and feeble growths, having small, narrow, yellowish leaves, after which the trees gradually die.

Pollen taken from the anthers of blossoms on diseased trees and used to fertilize the pistils of blossoms on healthy trees conveys the disease of such trees.

The first appearance of the disease in these identical peaches can be seen, usually, one month previous to their ripening, by the appearance of small red specks next to the pit—first at the stem and then all over the pit. These daily increase in number, and gradually extend through the larger veins into the smaller ones until every cell contains one or more of these specks. Seen under a powerful microscope the specks resemble small red globules in the fluid of the cells. When exposed to 180 deg. Fahrenheit in a fruit drier the globules dry and remain in the cellular tissues.

The next appearance of the disease in the tree is seen in the starting out of dormant buds on the affected limb, towards the trunk of the tree. The following year the peaches on the remainder of the limb become diseased; the sap in the limb acquiring an orange color, a slimy touch and sickish smell. As the disease increased it can be traced down the trunk of the tree, which is frequently followed by tufts of unnatural growth springing up at the base of the tree, the new wood and bark on the tree acquiring a softer, lighter and more spongy growth with the development of the disease.

The peach, apricot, nectarine, and almond are not exempt from the spread of the disease, even though budded on plum stalks. Vigor, health, age, soil, drainage, exposure, cutting off the affected limb, slitting the trunk, applying ashes, lye, salt, potash, superphosphates, or hot water, do not prevent the spread of the disease in the tree or orchard when once attacked. Nothing but the axe applied promptly and vigorously to the roots of the trees has prevented the spread of the disease. From the fact that the disease is first seen in the prematurely ripened and highly colored peach, before it has spread, by promptly removing the tree then and there the disease is effectually destroyed. By this means it has been entirely removed from our orchards.

Mr. Hurlbut, chairman of the committee appointed to draft a bill to prevent the spread of the yellows in the peach, not being present at the opening of the meeting, at the request of the society and with the consent of the rest of the committee, T. T. Lyon read a bill for that purpose, one of its essential features being that each township, at its annual election, must elect to come under the law by the appointment of a commissioner who shall have the general management of the disease. The bill was accepted by the society and held for discussion. When W. H. Hurlbut came in with his bill, which was read and accepted, the objection to this bill, as a whole, was raised that it did not provide for the appointment of a suitable person to look after the disease.

L. H. Bailey said as far as South Haven was concerned we had no need of a law.

C. H. Wigglesworth thought there might be need of it hereafter. He said that taking action against nursery trees was carrying the law too far.

C. H. Wigglesworth said a man might be sued for having diseased trees, but could not sue a man in a neighboring State who raised the trees.

Mr. Hurlbut replied that it should not prevent a law for ourselves.

Mr. Bailey said, Buy the trees of home nurseries.

A. T. Linderman said a penal law would prevent irresponsible persons peddling diseased trees.

A. S. Dyckman said a summary law should be passed for the entire destruction of the yellows in the State; the law was just and right, and ought to be enforced.

The secretary said that any section having the disease would be sick of it, and glad to get rid of it, and thank us for our assistance.

A. S. Dyckman did not believe any locality would try to preserve the yellows; if any did, he would like the world to know it. Let them stand out and clear us of the infamy; he was in favor of a law without exemption.

Mr. Hurlbut thought the Legislature would rather pass a whole law than a part of one.

T. T. Lyon did not like to risk the passage of a general law, and for that reason he thought each locality should elect to come under the law.

A. S. Dyckman moved the two bills be recommitted to the committee, with instructions to prepare out of both one bill, without any election clause, which bill should accompany the memorial, and be sent to the Legislature. Accepted.

H. E. BIDWELL, *Secretary*.

STATISTICAL FRUIT REPORT MADE TO THE SECRETARY OF THE STATE POMOLOGICAL SOCIETY.

SOUTH HAVEN, February 5, 1875.

DEAR SIR:—Your letter of inquiry as to the value of the orchard land in Van Buren county was duly received and read before our society, at which time I took an estimate of the value of our orchards,—the comparative yield and net returns for the past three years. To make my report complete I was requested to correspond with the leading fruit growers in the county; where-upon I addressed the following communication to one hundred of the largest fruit growers in Van Buren:

“MY DEAR SIR:—Please inform me, as far as practicable, what you estimate the value of your orchard at per acre; what is the value of the adjoining lands? Please give me the comparative extent and yield of your orchard in 1874, compared to 1872-3; also the price realized for the fruit. Please inform me of the proportionate loss, if any, by the winter of 1872-3. Are your trees in as healthy and vigorous a condition as in 1872?”

The reports as to the value of the orchards were variable,—from one hundred to one thousand dollars per acre, according to age, variety, and nearness to market. A low average estimate of the bearing apple orchards of the county is two hundred dollars per acre, the peach orchards at three hundred dollars, and the adjoining lands at from twenty-five to fifty dollars per acre. As a whole, the orchards are in as healthy a condition as in 1872.

It appears that the winter of 1872-3 injured but a portion of the fruit buds of the apple, so that the yield of fruit in 1872 was less than in 1873; but the increased price realized for the same made the net profit greater. In 1874 the yield of apples was greatly increased, so that the net returns were even more than in 1872 or 1873. The peach buds were injured by the cold winter in the eastern portion of the county, while in the western portion the crop was good, and the net returns were unusually large.

Allowing nearly 5,000 acres for the 145 small lakes that dot the county of Van Buren, and the waste surface of the Paw Paw, Black, and other small streams, which cross in their meanderings nearly one-half of all the sections of land, there would remain four hundred thousand acres of land, one-third of which is suitable for apple orchards and one-third for peach orchards, leaving

one-third for farming, timber, and grass lands. Of the 133,333 acres of land, but 7,629 acres were set in 1872. Allowing one-fifth for bearing, there were 1,526 that yielded 209,484 baskets of apples, netting at a low average price \$83,793.60, or \$54.91 per acre. In 1873 they bore 162,705 bushels, bringing \$89,488, or \$58.64 per acre. In 1874 there were 1,830 acres in bearing, yielding 251,380 bushels, netting \$125,690, or \$68.64 per acre, which was a steady net increase per acre in the face of the cold winter of 1872-3.

In 1872 but 945 acres were set to peaches. Allowing one-third for bearing, the 315 acres produced 62,929 bushels, yielding \$94,393, or over \$300 per acre. In 1873 one-fifth, or 63 acres, in South Haven township bore 9,072 bushels, bringing net \$27,296, or *four hundred and thirty-one dollars and sixty-eight cents per acre*. In 1874 there were 420 acres in bearing, yielding 84,100 bushels, netting \$126,150, or \$300.28 per acre.

The pear orchards in 1872 yielded net \$328 per acre; in 1873, \$560; in 1874, \$450.

The plum orchards in 1872 made a net yield of \$333 per acre; in 1873, \$288; in 1874, \$420.

The cherry orchards in 1872 made returns of \$407.40 per acre; in 1873, \$401.60; in 1874, \$450.

The grape vineyards in 1873 produced \$276 per acre; in 1873, \$440.50; in 1874, \$440.

The strawberry plantations in 1872 yielded \$239.10 per acre; in 1873, \$319.50; in 1874, \$237.50.

The currants in 1872 net \$468.60 per acre; in 1873, \$493.20; in 1874, \$450.

The average net per acre for the last three years for apples in bearing was \$60.73; for peaches, \$343.99; for pears, \$446; for plums, \$347; for cherries, \$419.67; for grapes, \$386.83; for strawberries, \$265.36; for currants, \$470.60. The average per acre for all fruits was \$342.52. Allowing all the apple land in Van Buren county to be set and in bearing it would produce, at the low price of fifty cents per bushel, \$9,199,977. Allowing the peach land to be set and in bearing, at one dollar per bushel, it would amount to \$16,666,600. Added to the product of the apple land the orcharding in Van Buren county would yield annually over *twenty-five million dollars*.

In reply to your further inquiry as to whether "good cultivation would double the value of the present orchards and net returns," if you include pruning, thinning, and grafting to improved varieties, we say emphatically, *yes*. Our orchardists are striving to obtain these results, and I cannot close this letter without thanking them for their full and prompt reply to your inquiries.

Yours respectfully,

H. E. BIDWELL.

PRUNING.

SOUTH HAVEN, February 20, 1875.

The pomological society met Monday evening to discuss the subject of pruning.

George L. Seaver inquired if the late severe weather would alter our method of pruning.

W. H. Hurlbut said he had cut several limbs of peaches since the cold spell and thawed them out in a warm room, and he found some good fruit buds; no wood buds were injured. This was a severe test for the trial of buds, and sudden thawing out would injure many good buds. Those least developed are least injured. In reply to George L. Seaver's inquiry, he said that where the wood was injured by the winter he would prune it off early in the spring.

President Lyon said that if he wanted to prune for wood we should prune in spring. In reply to George L. Seaver, he said that apples would doubtless prove uninjured; but on peach, apricot, and sweet cherry trees, some limbs would be injured and need to be removed.

O. C. Lathrop gave the familiar quotation that "as the twig was bent, the tree inclined," and he would early shape the future tree. He thought that certain varieties of peaches, especially the Crawford, should be pruned in summer, to induce bearing; more prolific kinds, like Barnards, in the spring. He favored medium high heads, to facilitate cultivation. In pruning he would head in and thin out.

President Lyon said he would shorten, but not so much as to prevent thickening up, but enough to keep up the growth in the center of the tree; he thought the wood growth of the Crawford was usually too strong, and more fruit buds could be produced by summer pruning of the terminal shoots the last of June; we need to study the habits of the trees and prune different varieties differently. He thought it practicable to prune small orchards systematically, and for certain purposes and certain varieties it would be practicable to prune large orchards. The usual idea had in view in pruning is shape, which cannot be done correctly when the sap is in motion. Pruning should be done in March, so the cut surface would dry and heal; would not prune in summer, except to cut off water shoots.

W. H. Hurlbut said he would cut back when the trees were young, to multiply the leading branches so as to avoid crotches. In order to get stocky shoots he would thin out. He preferred to prune in May. Would prune Barnards up, Crawfords down.

President Lyon said to avoid crotches he would encourage the growth of a leader. On philosophic principles, pruning in spring threw the strength into the remainder of the limbs. In pruning, always give the root the balance of power.

W. H. Hurlbut said, Prune grapes between the middle of April and May and they will bear more, but make less wood growth; they will necessarily bleed some then, but tapping trees does not injure them. (There are different views entertained by others).

O. C. Lathrop said, The theory of close pruning was fast dying out; more wood growth encouraged more root growth; would prune in spring.

A. S. Dyckman thought the *method* of pruning caused more injury than the *time* at which it was done. Adopt some system, and make the trees conform to that system; he was in favor of low pruning; would only cut back long limbs, and would prune by thinning; preserved to grow three main branches.

H. J. Edgell inquired if the sap was supplied by cells independent of each other.

President Lyon replied that if cut off the sap was directed into other channels; prune as little as possible; all severe pruning is injurious.

The secretary said increased manuring was cheaper than pruning.

Inquiry was made as to the prospect for peaches.

A. S. Dyckman said he had examined his buds, but thought we must wait until they were thawed out before we could be sure; his lowest record was 16° below zero. O. C. Lathrop's lowest record was 18° below; I. S. Linderman reports 16° below; the secretary, 22° below; cold of short duration and the air still. Allowance should be made for the difference in thermometers; altitude and air drainage had much to do with temperature.

The president said to test thermometers, stand them in water and bring it to boiling, when it should mark 212; place it in the snow and bring it to a thaw, and it would mark 32; add salt to the snow and it would indicate zero.

D. C. Loveday said he cut a large limb of Early York peach and put it in his cellar, and when thawed out found one bud in eight good.

E. J. Lockwood felt sure he would have a crop of peaches.

L. H. Bailey was very sanguine of a crop.

The subject for discussion next Monday evening will be "The best varieties of small fruit," to be opened by C. H. Wigglesworth.

BEST METHOD OF PACKING FRUIT.

SOUTH HAVEN, Monday, March 22, 1875.

The regular question for discussion Monday evening was "The Best Method of Packing Fruit." The secretary read the special rule that related to the packing of fruit, adopted by the Northwestern Fruit Distributing Association, as follows:

"All fruit shipped by members of this association shall, as far as possible, be strictly graded as follows: 1st grade, which shall have none but sound fruit in it, and shall be strictly of the same general grade throughout the package, provided that some of the very finest may be denominated "fancy." The second grade shall be constituted of such fair fruit as will pay for shipment, but which is not guaranteed perfect, although it is entirely sound."

The objection to this grading is that what one may call good another may call fancy, and what one will only call fair another may grade as good.

President Lyon said that the grading of fruits should be determined by inspection. Mr. A packs a shipment of peaches and puts on the trade mark for No. 1 fruit. Mr. B puts up a shipment and also marks it No. 1. They may be 25 per cent better or poorer. This 50 per cent difference can only be determined by a competent inspector. A trade mark so used by the society, or any association, would benefit the buyer as well as the seller 15 to 20 per cent, and by affixing a small fee for inspection it would prove a source of revenue to the society or association. This trade mark could be so easily and cheaply secured, so readily and generally known that it would become popular and profitable at once, and not require the time usually employed in making a reputation for an individual brand.

Mr. Phillips said the time required to inspect the fruit seemed to be the principal objection.

C. J. Monroe thought the greatest objection was in opening and closing the package.

C. H. Wigglesworth said a greater difficulty was in displacing and replacing the fruit.

T. T. Lyon described a method of rapid inspection which looked practical.

The secretary thought a little study would remove all apparent difficulties. If it would pay he was in favor of trying it.

F. A. Wakefield said that with a large quantity of fruit inspection would be difficult. Let every man pack his fruit alike, and let an inspector grade it.

N. Phillips said no one had yet abused our present trade mark, which was affixed by each individual. On the contrary, we could not supply the orders for trade mark fruit last season.

C. H. Wigglesworth added that he packed his peaches with so much care,—red checks up,—that they could not be displaced for inspecting the center and be returned in place without spoiling the appearance of the package; he said the eye bought the peaches heretofore. If the difficulties could be overcome the benefits would be great. Doubtless 25 per cent, only a portion of the fruit, would need inspection; cheap labor could assist the inspector; boys and girls could open and close the packages. In regard to the picking of berries, as far as practicable he picked in the cool of the day when the dew was off, keeping the package in a shady place, filling any vacancies from settling when they were closed for shipment. On picking fruit he usually made but one grade for berries (as they run). Peaches, pears, and apples he assorted, first class, for those of means; second class, for the people; third class, to be given to the poor.

Before the meeting adjourned, N. Phillips inquired if any new evidence could be added to the beneficial effects of evergreens for wind-breaks. Mr. Burnes, of St. Joseph, gave a very forcible illustration of the clearing of a strip of timber next to the lake adjoining his place, where a man lost his entire orchard by its consequent exposure to the wind.

THE GRAND TRAVERSE UNION AGRICULTURAL SOCIETY.

BY HON. D. C. LEACH, EDITOR OF THE GRAND TRAVERSE HERALD.

TRAVERSE CITY, October, 1874.

This society embraces the eight counties in the northern part of the Lower Peninsula, and is what is commonly known as the "Grand Traverse country."

HISTORY OF THE SOCIETY.

During the spring and summer of 1868 the Grand Traverse Herald published several editorial articles urging the formation of an agricultural society. The proposition was well received by farmers and by our people generally. As a result of our suggestions, a call was published in the Herald of June 12th of that year, for a meeting at the county clerk's office on the 8th of July. On the 3d of July the Herald again took up the subject, reviewed it at some length, and urged the farmers to take earnestly hold of the matter.

The meeting on the 8th of July was well attended. Hon. Morgan Bates acted as chairman, and R. Hatch, Jr., as secretary; a constitution was adopted, officers elected and the society fully organized.

The name chosen by the society was that which it bears at this time,—Grand Traverse Union Agricultural Society. The officers elected were the following:

President—A. B. Dunlap.

Secretary—R. Hatch, Jr.

Treasurer—D. C. Leach.

Vice-Presidents—E. P. Ladd, H. D. Campbell, J. K. Gunton, J. Dean, J. Lee, G. N. Smith, R. Knight, L. R. Smith, and J. S. Dixon.

The first fair was held on the 14th and 15th days of October. It was even more successful than the most sanguine had ventured to hope. Hon. A. B. Dunlap, the president of the society, delivered the address. Number of entries for premiums, 251.

The officers elected at the annual meeting were as follows:

President—E. P. Ladd.

Secretary—R. Hatch, Jr.

Treasurer—D. C. Leach.

Vice-Presidents—C. Fowler, Sr., H. D. Campbell, J. K. Gunton, R. Johnson, W. S. Hubbell, H. Monroe, G. N. Smith, J. Lee, A. B. Dunlap, George Thompson, J. E. Fisher, L. R. Smith, R. Knight, J. P. Brand, G. C. Lull, J. S. Dixon, and A. D. Brady.

The second annual fair was held October 6th and 7th, 1869. The number of entries for premiums this year was 306. Hon. Sanford Howard, then secretary of the State Board of Agriculture, delivered the address. This second fair was fully up to the anticipations of the most sanguine.

The officers elected were as follows:

President—George Parmelee.

Secretary—R. Hatch, Jr.

Treasurer—D. C. Leach.

Members of the Board of Directors—Henry Monroe, S. Rushmore, Richard Orr, E. L. Sprague, A. B. Dunlap, C. A. Hannaford, I. N. Carpenter, Rev. J. Pettitt, L. Judson, Hugh Miller.

The third annual fair was held October 5th and 6th, 1870. Like its predecessors it was a success. Number of entries, 247. Mr. George Parmelee, the president of the society, delivered the address. Officers were elected as follows:

President—Perry Hannah.

Secretary—R. Hatch, Jr.

Treasurer—R. W. Bagot.

Vice-President—H. H. Noble.

Board of Directors.—W. H. Fife, T. Wynkeep, R. Knight, G. C. Lull, A. B. Dunlap, Rev. G. Thompson, W. S. Hubbell, T. M. Walkly, T. J. Thorp.—Call, Sr.

No fair was held in 1871. The fourth was held October 2d and 3d, 1872. It was more successful than any of its predecessors. In fact, it may be remarked of the fairs of this society that they indicate, from year to year, the general development and growth of the country. Nearly twice as many people attended the fourth fair as had been present at any previous one. Mr. Parmelee delivered the address. The officers elected were as follows:

President—J. G. Ramsdell.

Secretary—L. H. Gage.

Treasurer—P. Hannah.

Board of Directors—H. W. Curtis, J. Pulcipher, H. H. Noble, R. Knight, G. Thompson, J. Porter, L. W. Case, L. Judson, H. Miller, H. B. Sturtevant, A. T. Kellogg, D. Reeder.

The fifth annual fair was held on the 10th, 11th, and 12th days of October, 1873, in connection with the October meeting of the State Pomological Society. It far exceeded any previous fair in the number of entries, the number of people in attendance, the cash receipts, and the general interest manifested. These results were largely owing to the fact of the State Pomological Society meeting with us.

The following is a list of the officers elected:

President—H. W. Curtis.

Secretary—L. H. Gage.

Treasurer—T. T. Bates.

Board of Directors—R. Knight, A. Campbell, L. W. Case, L. P. Judson, J. S. Dixon, A. Butters, J. K. Gunton, W. W. Bartlett, A. T. Kellogg, U. V. Hill, J. Lee, O. H. White, W. Reeder, J. J. Pollard.

Thus far the Society has been more successful than its most sanguine friends and projectors ventured to hope. That the fairs have been worth to the country a great deal more than they have cost, no intelligent person will deny. The benefits predicted from such an organization have been more than realized. Its mission is not yet ended.

THE OCTOBER FAIR OF 1874.

The exhibition of fruit was the main feature. One must see for himself to understand and appreciate fully what such a collection of Grand Traverse fruit really is. But we will try to give our readers a faint idea of what is to be seen in the first department of Floral Hall. Starting in the southwest corner of the hall we begin with the collection put on exhibition by

HON. PERRY HANNAH.

The space occupied by Mr. Hannah's fruit is beautifully decorated with evergreens, fruit boughs, etc. But more beautiful and attractive than the decorations is the fruit itself. Apples, of course, occupy a large share of the space. Of this fruit Mr. Hannah exhibits 168 plates, embracing 40 varieties. He also has two shelves and sixteen baskets filled with apples. Most noticeable among them are the Rhode Island Greening, Baldwin, Golden Russet, King of Tompkins county, Wagener, Northern Spy, and Spitzenburg. Mr. Hannah's collection embraces 40 varieties of apples, 12 of pears, and 8 of peaches.

Next in order comes the collection of

PENINSULA GRANGE.

This collection embraces 270 plates of apples, 7 of peaches, 2 of plums, 12 of grapes, 18 of pears. There are in the collection 50 varieties of apples; how many of other fruits we are not prepared to say. The leading varieties are the Golden Russett, Rhode Island Greening, Baldwin, Wagener, King of Tompkins County, Cayuga Redstreak, Yellow Bellflower, etc. It is as fine a lot of fruit as one could wish to see. The

INDIVIDUAL COLLECTIONS

mentioned below are most of them embraced in the Grange collection.

H. W. Curtis has 131 plates of apples, 11 of pears, 5 of peaches, 2 of quinces, and 1 of crabs. He has 20 varieties of apples, 6 of pears, 3 of peaches. J. Helffereitch has 8 varieties of apples; J. W. Parker, 11; B. F. Schetterly, 6, and 1 of pears; J. M. Pratt, 4 of apples and 4 of grapes; J. Makinster, 6 of apples; G. Lardie, Sen., 6 of apples; C. Fowler, Sen., 1 of apples and one of pears; M. Swany, 6 of apples; J. B. Barney, 8 of grapes; A. P. Lancaster, 12 of apples, 3 of pears; J. E. Savage, 6 of apples; W. F. Christopher, 2 of pears; E. Franklin, 5 of apples and 3 of pears; E. P. Ladd, 4 of apples, 2 of plums; W. R. Stone, 2 of apples, 2 of pears; T. Tyrer, 5 of apples; C. Kroupa, 2 of apples; W. Golden, 14 of apples, 2 of pears; P. Stewart, 3 of apples, 4 of pears; C. Hawkins, 1 of apples; L. N. Beers, 2 of apples; G. Parmelee, 9 of apples, 1 of peaches.

In the grange collection there were one can each of dried sweet corn, turnips, potatoes, apples, tomatoes, pumpkins, blackberries and squashes, from the drying establishment of Messrs. McCallum, Reynolds & Tracy; and canned pears, peaches, and tomatoes from H. W. Curtis.

Next in order is the collection entered by

TRAVERSE CITY GRANGE.

In this collection we find the following: J. G. Ramsdell, one hundred plates of grapes, embracing thirteen varieties; seven plates of peaches; nineteen plates, ten varieties, of apples; two plates of plums; three of pears; one of nectarines.

A. B. Dunlap has seven plates of grapes; eleven of peaches; two of apples, and a fine lot of canned fruits.

Wm. Rennie, three plates Hawley apples; R. Mullen four plates of grapes, and four of apples. There are also in this collection fifty plates of apples, twenty varieties, contributors' names not given.

Passing from the grange fruits we come to the following

INDIVIDUAL COLLECTIONS:

J. McDonald, nineteen plates of apples and one of peaches. In Mr. McDonald's collection are eight plates of superb Northern Spies. A. T. Allen has eight plates of apples and one of pears; A. Campbell, two of apples; J. Parody, one of apples—finest Gillflowers we ever saw; C. Johnson, one of apples; Riel Johnson, twelve plates of apples; Jos. Sours, twenty-six plates of apples; G. E. Steele, five plates of apples; M. Gay, three plates of apples; R. Sherman, twenty-one plates of apples.

A. K. Montague has thirty-eight plates of apples, one of quinces; B. Montague, nine plates of apples, and two of pears; J. K. Gunton, two plates of apples, one of crabs, four of pears, and nine of grapes.

Next we come to individual collections

FROM LEELANAW COUNTY.

James Lee—he's always on hand at fair time—has forty plates of apples, four of pears, three of grapes, two of crabs, one of prunes; Wm. Mebert has eleven plates of apples, each of a different variety.

M. V. C. Miller, proprietor of the Mission orchard at New Mission, has a very fine collection of apples, eighty-eight plates in all, and made up of some thirty varieties. He has also two plates of pears. The fruit from Leelanaw county is all very choice.

COLLECTIONS OF VEGETABLES.

There were several collections of vegetables at the fair which were worthy of special notice. The largest collection was that of J. K. Gunton. It was, indeed, a model collection. Every article in it was first-class, from the smallest item to the fourteen-foot sunflower. These vegetables were all from Mr. Gunton's garden, three miles from town. It does injustice to no one to say that he has the finest garden in the Traverse region.

A. P. Gray, Geo. Roush, O. E. Clark and D. C. D. Brooks also had fine collections of vegetables. Neither of them had as large collections as Mr. Gunton, but their articles were equally excellent. Every fair is largely indebted to these gentlemen for numerous contributions.

CANNED AND PRESERVED FRUITS.

In this line Mrs. Gage and Mrs. Dunlap had fine collections. Judge Ramsdell and H. W. Curtis had several samples, all of excellent quality. P. Allyn, who took so many premiums at the State Fair, was, of course, on hand with numerous samples, all good. The conclusion we came to was that Grand Traverse ladies and gentlemen, too, understand fruit canning and preserving to perfection. This must be so, or else there is something in the fruit or in the atmosphere that makes fruit preserving unusually easy. Mrs. Ide had fine samples of canned fruits.

FLOWERS, ETC.

Flowers, as usual, were abundant, notwithstanding the lateness of the season.

Mrs. J. Cram's house-plants made a brilliant show of foliage and bloom; a large moss basket filled with flowers, from Mrs. A. D. McRae, was lovely to behold, and a large pyramid of dahlias from Mrs. Crane was gorgeous in the extreme, as also a box of the same flowers, mingled with rose geraniums, from Mrs. Rickard. Also a large collection of cut flowers contributed by Mrs. Cram and Mrs. T. T. Bates; two bouquets of wall flowers from Mrs. Mebert; several flat bouquets and other flowers. Mrs. Ashton's fountain was playing away right merrily, dashing a silvery spray over exquisite little bouquets of pansies and roses, and delighting the hearts of sundry small boys and girls who stood admiringly around.

The house plants and flowers furnished by Mrs. Cram and Mrs. Bates have become a noted feature of our fairs. There are but few ladies in the State that have as fine collections, and the pains they always take to display them at our fairs is worthy of high praise.

MISCELLANEOUS.

Mrs. J. McDonald, Mrs. E. Roush, Mrs. O. E. Clark, Mrs. H. Voorheis, Mrs. E. S. Micham, Mrs. L. S. Craine, and Mrs. O. F. Hadley have butter on exhibition that is good to look at, and we doubt not pleasant to take.

O. Hoxsie and N. Hammond have fine samples of honey. We think no honey was shown at either of our first three fairs.

Mrs. A. B. Dunlap has a tub of the nicest, whitest, sweetest maple sugar that we ever saw. And right here, as well as anywhere, we may say that from the first Mrs. Dunlap has done more than any other lady in the community to make our fairs a success.

Mr. Joseph Archer has the only nursery stock on exhibition,—fine, thrifty trees.

One of the most interesting cases of curiosities exhibited is from the

ELK RAPIDS IRON CO.

It contained five samples of charcoal pig iron, from Nos. 1 to 5, manufactured at their furnace; five specimens of as many different varieties of iron ore; numerous samples of charcoal, limestone, cinders, etc.; everything that goes into the furnace or comes out of it. It attracted much attention.

PICTURES.

Miss Mary Goodrich had three oil paintings, one a winter scene, and two other landscapes; Miss Emma Leach, the Barefoot Boy and a little landscape; Mrs. Sayler, a large painting, Sunset on the Sea, another, the Kid's Playground, Horses in a Storm, a winter scene, embracing the "noble red man" and squaw crossing the ice, and a child's portrait; two paintings by Mrs. Ashton, landscapes; three by Mrs. Ramsdell, Traverse City in 1869, a Ruined Castle, and another landscape; one oil painting by J. W. Simpson.

Of pencil drawings there was one of flowers by Miss Blinn, another by Miss Mitchell, and specimens of lettering with pencil by Henry Perry, which showed no little talent. Some very pretty ferns in spatter work were shown by Miss Blinn.

Chromos and other pictures were contributed for the occasion by T. T. Bates, B. J. Morgan, L. Roberts, and others.

BUSINESS.

The entire receipts of the fair were \$559 67. The old indebtedness was

§359 02. Expense of the fair, \$232 42, leaving the society in debt to P. Hannah \$31 77, which amount was donated and the indebtedness cancelled.

Officers were elected for 1875 as follows:

President—W. W. Tracy, of Peninsula.

Secretary—L. H. Gage, of Traverse.

Treasurer—T. T. Bates, of Traverse.

Executive Committee—James Lee, V. C. Miller, Leelanaw county; H. O. Mack, T. M. Walkley, Benzie; J. B. Haviland, O. E. Clark, Traverse; G. E. Steele, Chas. Ball, Antrim; J. S. Dixon, Hugh Miller, Charlevoix; T. A. Ferguson, I. N. Carpenter, Wexford; W. Reeder, B. C. Bonnell, Missaukee; O. S. Curtis, A. C. Beebe, Kalkaska.

A vote of thanks to the officers of the society for the manner in which they have performed their duties was unanimously adopted. And it was well deserved. The outgoing president, H. W. Curtis, has been untiring in his efforts to promote the welfare of the society. His administration has been a success. Secretary Gage and Treasurer Bates have been equally faithful and efficient.

The constitution of the society requires the president to deliver or cause to be delivered an annual address. President Curtis, in obedience to the letter as well as the spirit of the constitution, called the audience together to listen to his address. Order being secured, he said:

LADIES AND GENTLEMEN:—Verily we have a goodly heritage.

This most admirable address,—the shortest and most appropriate, probably, ever delivered on such an occasion,—was received with enthusiastic applause.

GRAND RIVER VALLEY HORTICULTURAL SOCIETY.

To the Secretary of the Michigan State Pomological Society :

DEAR SIR:—In compliance with the act of the State Legislature, I have the honor to hand you herewith the first annual report of the Grand River Valley Horticultural Society, for 1874, and papers pertaining to its transactions.

Very respectfully, your obedient servant,

C. J. DIETRICH,
Sec'y G. R. V. Hort. Society.

OFFICERS FOR 1874.

President—Edward Bradfield of Ada, Kent county.

Vice-President—Henry Holt of Cascade, Kent county.

Secretary—C. Joseph Dietrich of Grand Rapids City.

Treasurer—George W. Dickinson of Grand Rapids City.

Executive Board—Henry Holt of Cascade; William Rowe of Walker; John Suttle of Grand Rapids; C. N. Merriman of Grand Rapids City.

Ex Officio—The President, E. Bradfield; the Secretary, C. J. Dietrich; the Treasurer, George W. Dickinson.

ARTICLES OF ASSOCIATION.

In compliance with the requirements of an act of the Legislature of the State of Michigan, entitled, "An act to provide for the incorporation of societies for the promotion of pomology and horticulture and the kindred arts and sciences in the State of Michigan," said act approved April 15th, A. D. 1871, we the undersigned, at the city of Grand Rapids, this tenth day of February, in the year of our Lord one thousand eight hundred and seventy-four, do hereby associate ourselves under the name and style of the GRAND RIVER VALLEY HORTICULTURAL SOCIETY, and agree to be regulated by the following articles of association :

ARTICLE I.—OBJECT.

The object of this society is to develop facts and promulgate information connected with pomology and general horticulture.

ARTICLE II.—OFFICERS.

The officers of this society shall consist of a president, a vice-president, a secretary, a treasurer, and an executive board of seven members, of which the president, secretary and

treasurer shall be members *ex officio*; of which board four members being present shall constitute a quorum for the transaction of business, provided that each member shall have been duly notified of the time and place of meeting. All of the above officers to be elected annually, by ballot.

ARTICLE III.—PROPERTY.

This society may hold personal and real estate to the amount of ten thousand dollars.

ARTICLE IV.—MEMBERSHIP.

Any gentleman may become an annual member by the payment of one dollar each year in advance, and may become a life member by the payment of ten dollars.

Any lady may become an annual member by the payment of fifty cents each year in advance, and a life member by the payment of five dollars.

ARTICLE V.—DISTRICT.

The district or territory in which this Society may carry on its operations shall consist of the counties of Kent, Montcalm, Ionia, Barry, Allegan, Ottawa, and Muskegon, in the State of Michigan.

ARTICLE VI.—ANNUAL MEETING.

The annual meeting for the election of officers shall be on the first Tuesday in October in each year; the officers elected at such meeting to commence service on the first Tuesday in November next following.

ARTICLE VII.—EXPIRATION OF TERM OF OFFICE.

The officers shall perform their respective duties until their successors are elected and have accepted. But the regular term of office expires as indicated in Article 6th.

ARTICLE VIII.—MEETINGS.

The time and place for holding the regular meetings shall be at the city of Grand Rapids, on the first Tuesday in each month; yet the Executive Board may change the time of any regular meeting to any other day, should circumstances seem to demand it, and may also call special meetings, and designate the place for such.

ARTICLE IX.—DISBURSEMENTS.

No money shall be disbursed except on an order signed by the President and Secretary.

ARTICLE X.—BY-LAWS.

By-laws not in conflict with these articles may be adopted at any regular meeting of the Society, one month's notice having been given.

ARTICLE XI.—AMENDMENTS.

These Articles may be amended at any regular meeting of the Society, provided such amendment shall have been noticed at the regular meeting preceding.

Signed by—

C. J. DIETRICH,
E. BRADFIELD,
A. T. LINDERMAN,
REUBEN H. SMITH,
C. N. MERRIMAN,
WM. I. BLAKELY,
HENRY HOLT,

GEO. W. DICKINSON,
A. S. WHITE,
JOHN SUTTLE,
WM. ROWE,
H. R. PIERCE,
S. L. FULLER,
D. L. ARNOLD.

BY-LAWS.—ADOPTED MARCH 3, 1874.

PRESIDENT.

SECTION 1. The President shall be the executive officer of the Society, and of the Executive Board, and shall preside at all meetings. He shall see that the rules and regulations are duly observed and enforced. He shall have the best interests of the Society at heart, and shall lead in forwarding any enterprise that shall add to its use or popularity.

VICE-PRESIDENT.

SEC. 2. The Vice-President shall, in the absence of the President, perform all the duties of said office; and in case of resignation or removal, either by death or otherwise, of the President, the duties of the office shall devolve upon the Vice-President, for the remainder of the term for which they were elected.

SECRETARY.

SEC. 3. The Secretary shall be the recording, corresponding, financial, auditing and accounting officer of the Society. He shall attend all meetings of the Society and Executive Board, and shall keep an accurate record of the proceedings. He shall sign all membership certificates, all awarded diplomas, and have charge of the Society's books and papers and any other property given into his care by the Society, and shall be responsible for the same. He shall attend to the public announcement of the Society's meetings. It shall be his duty each year, in the month of November, to render an abridged report of the Society's proceedings to the Secretary of the State Pomological Society, in conjunction with an advisory committee appointed by the Executive Board.

TREASURER.

SEC. 4. All funds belonging to the Society shall be deposited with the Treasurer, who shall pay out the same only upon orders drawn by the Secretary and signed by the President. It shall be the duty of the Treasurer to keep an accurate account of all moneys received and paid out by him, and shall be prepared to report the condition of the Society's finances at the expiration of each year's services, or whenever the Executive Board may require him to do so.

EXECUTIVE BOARD.

SEC. 5. The Executive Board shall be the judicial body of the Society and shall enact all laws, rules, and regulations for the government of the Society, and shall have full charge of the annual fairs. The Executive Board shall have full power to displace any officer for neglect of duty or abuse of position, and shall fill all vacancies, not otherwise provided for, by appointment. The members of the Executive Board shall consider the announcement of a regular meeting of the Society, to be due notice to each one for a meeting of the Board, as the President shall have authority at such regular meetings to convene the Board at any hour, and any business transacted at such meeting of the Board shall be legal, provided a quorum be present. Special meetings of the Board will require a personal notice through the U. S. mail, from the Secretary to each individual member, and may be called by the President or any three members of the Board. The Board shall look after the general interests of the Society, keep the Society upon a sound financial basis, and provide for all its necessities as they may arise. The Executive Board shall report to the Society, through the Secretary, all of its important operations.

ALTERATIONS OR AMENDMENTS.

SEC. 6. Any addition or revision of these By-Laws may be made by a two-thirds vote of the members present at any regular meeting of the Society, one month's notice having been given of such alteration or amendment.

RULES.

SEC. 7. Ordinary parliamentary rules and usages shall govern all meetings of the Society, special or regular.

AN APPEAL FOR HORTICULTURE.

READ AT THE APRIL MEETING OF THE GRAND RIVER VALLEY HORTICULTURAL SOCIETY, HELD AT GRAND RAPIDS, BY WM. ROWE, FLORIST,
OF WALKER TOWNSHIP, KENT COUNTY.

MR. PRESIDENT AND GENTLEMEN:—I would call attention to two facts in Horticulture which have an important bearing upon us as citizens of the Grand River Valley, namely, its commercial interest and its moral influence. Patrick Barry, President of the Western New York Horticultural Society, in 1871, in his annual address before the society, is credited with saying that hundreds and thousands, or he might say millions of dollars are being brought into New York for fruit trees, shrubbery, plants, and seeds. The Michigan Farmer, commenting on Mr. Barry's remarks, asks the question, Will not this apply to Michigan? May I not ask, Will not this apply to the Grand River Valley? Cannot the Grand River Valley grow its own fruit trees, shrubbery,

plants, and seeds, and some to spare, as well as Western New York? Most assuredly we can; any one doubting this will please visit some of the nurseries, beautiful gardens and well stocked green-houses that are springing up all around us; and for further proof allow me to refer to the two great exhibitions held in this city. The Horticultural department was under the direction of the State Pomological Society, whose active members were largely from the Grand River Valley, and whose exhibitions were pronounced by good judges second to none in the United States. It is evident, then, that we have a soil and climate that are favorable to our operations, and it opens a broad field, commercially, to the enterprising horticulturist, surrounded, as we are, by a large territory that is fast developing its resources, and through the intelligence of its citizens will furnish a market for all classes of horticultural stock for many years to come; hence we see horticulture commercially beckon us onward.

Let us glance for a moment from a higher standpoint at its moral influence, —and it can only be a glance, for it is beyond the power of man to get a full view of the immense influence brought to bear on the mind of man through a practical knowledge of horticulture. The Hon. Judge Graves, of the Supreme Court, in his remarks before the State Pomological Society, at one of the evening meetings held in this city during the last fair, said: "Having many years' experience in the law courts of our country, I have never yet seen a live horticulturist, one engaged in the cultivation of fruits and flowers, arraigned in court for vice or crime." This beautiful compliment should induce every man and woman in the land to know something of this elevating science, if it is only the planting of a currant tree or the care of a single plant in the window. It is better than nothing. It may be the commencement of a noble work. Why, I believe if there was a horticultural society organized in every town in the land, and the people could be induced to meet and discuss the interest and growth of fruits and flowers and the beautifying of their homes, it would do more to stay the tide of crime and vice than one-half of the so-called reform societies of the present day. Its influence hews off the ragged corners and smoothes down the rough surface of humanity, and the man or woman thus engaged becomes more observing of natural laws and nearer Nature's God. Here, then, gentlemen, is a work for us to do, a great missionary work of no small importance; and here I would kindly invite you, if you are a successful orchardist or vineyardist, please to give us your mode of success. If you are a florist, and succeed in growing a rose tree, a fuchsia or geranium better than your neighbors, please to tell us how you do it; or if you are a gardener, and have the ability to lay out and beautify our homes, please to let us hear from you. Don't be selfish about these things, and shut yourself under a bushel, but shine forth bright as the morning sun to enlighten the pathway of your neighbor on to success.

HOW TO PICK AND PACK APPLES, AND WHERE TO KEEP THEM, AND WHEN TO SELL THEM.

AN ESSAY READ BEFORE THE GRAND RIVER VALLEY HORTICULTURAL SOCIETY, TUESDAY, JANUARY 5, 1875, BY P. W. JOHNSON, OF WALKER.

There is no doubt that a lack of success in keeping fruit with many fruit

growers is the result of careless handling. Some men will shake off apples, pick them up, and empty them from the baskets as they do potatoes, and then wonder why they don't keep.

Too much care cannot be taken in handling fruit designed for late keeping. Of course there is a great difference in varieties in this respect; some of the dryer, tough-skinned sorts will bear slight bruising with impunity, while juicy, thin-skinned sorts—as the Northern Spy—must be handled as you would handle eggs.

For picking apples I consider a nimble pair of hands the best apparatus ever invented, the only question being, how to reach the fruit to be picked. Many of the step-ladders used for this purpose I consider a nuisance,—especially those with double sides and platform tops, so common in my vicinity.

When using one of them it seems as though an apple could hardly fall to the ground without hitting it somewhere, frequently bounding from step to step on its way down. While step-ladders may sometimes be useful, I prefer light ladders of suitable length.

Some people show astonishing ignorance of the law of gravitation in setting up a fruit ladder, frequently resting it upon weak limbs at an angle of forty-five degrees, only to learn wisdom by experience. Fruit on the outermost limbs is frequently difficult of access, the branches not seeming to be of the requisite strength or stiffness to support the ladder and picker, but by setting the ladder nearly perpendicular and resting only its outer side against the limb, the limb will bend around as you climb until both sides rest against it and you pick with safety. A hook with a handle four or five feet long to pull in limbs just out of reach, will be found of use, and can be hung on a round of the ladder when not in use. A tongue ladder will frequently be very handy. As to the proper time for gathering fruit, very much depends on the season and maturity. For myself, unless the fruit shows signs of softening, I incline to as late gathering as is safe. Fruit should be dry when picked, especially if barreled.

In picking do not pull toward you; a slight twist of the wrist will part the stem from its twig and not cause others to fall.

Have a hook attached to your pail or basket, by which to hang it to ladder or limb. Do not toss the fruit in, lay it in as quickly as you please, but carefully. In picking from the center of the tree a cord or strap with a snap attached is convenient to lower the basket to a man on the ground, who can change and empty the baskets, thus saving delay and much extra climbing. Avoid handling as much as possible, sorting from the basket in which it is picked into the barrel, rejecting all that is wormy or inferior. I think it is generally conceded that apples keep better in barrels than in bins. Some prefer to head up immediately, others let them pass through the sweating process before heading up. Which of these two methods is the better? I have not yet sufficiently experimented to advise. My own practice has been to let them stand open for a while. They should be put where they will keep coolest and of most uniform temperature. A shed or building open on the north is best. As soon as there is real danger of freezing remove to the cellar.

Don't smother your cellar, but while taking every needed precaution against freezing, let it have good ventilation and outside air whenever the air will permit. Keep the temperature as near the freezing point as you dare, and watch closely. The cellar should be dry,—not too dry, or the fruit will wilt. In some cellars, though cool, fruit wilts badly, losing in bulk and appearance very

much. In such a case I would sprinkle the floor with water sufficient to counteract its effects. As warmth and excessive moisture are the two principal agencies in the ripening of fruit, it follows that whatever will secure the opposite of these conditions will best insure success in the late keeping of fruits.

When apples have been properly packed I think nothing is gained by winter sorting. Better let them remain undisturbed till wanted for market. I find that the greatest difficulty commences with the opening of spring weather, and the difficulty increases as the weather grows warmer. How to prolong the temperature and condition in which they have been kept through the winter seems to be the question that involves the success of late keeping. One writer advances the idea of a double or two story cellar. Ice might be used if such an atmosphere could be rid of its excessive moisture. One the whole, our more northerly friends, with their prolonged winters, have the advantage of us in keeping fruit.

When the question of cheap transportation shall be solved, and we can send our apples north to winter, we may expect to feast upon them in June. Or had we a Mount Washington, with its railroads, we might reach the result by a short cut. As it yet remains, we are obliged to confine our efforts at late keeping to such varieties as can best withstand the changes to which they are unavoidably subjected. It may be asked, will all this care and labor pay in dollars and cents? I have repeatedly sold apples in June for twenty shillings per bushel that would only bring half that sum by the barrel in the fall. At this day, when the tendency is to quickly overdo in turn everything that pays, he who, stepping aside from the beaten path, can successfully overcome the obstacles that nature thrusts in the way of the husbandman, whether of blight or destroying insect, dry summers or change of season, will be most sure of success.

GRAPE CULTURE.

AN ESSAY READ BEFORE THE GRAND RIVER VALLEY HORTICULTURAL SOCIETY AT ITS MARCH MEETING IN 1875, BY THE PRESIDENT, E. BRADFIELD, OF ADA, KENT COUNTY.

GENTLEMEN:—In complying with your request to read a short paper on the planting and care of grape vines, the first two years after planting, for the purpose of eliciting discussion on the subject, I respectfully submit the following:

Any soil that will produce a good crop of wheat, corn, or vegetables, will produce grapes with equal care and cultivation.

But to secure the best results, and immunity from drought and excessive moisture, the ground should be trenched, inverting the soil from eighteen inches to two feet deep, and this can be best done in the garden with the spade.

If a single vine is to be planted, dig a hole three or four feet square and of the required depth, and if the sub-soil is poor remove entirely eight or ten inches of the bottom. On returning part of the soil to the hole thoroughly mix it with some rotten manure and leached ashes, adding enough surface soil to supply the subsoil removed. If a row is to be planted, fill the first excavation with the next three feet in the direction of the row, mixing in manure and removing the subsoil as before, until the whole strip is thus worked, fill-

ing up the last space with the earth taken out at the commencement. On a larger scale, the plow will answer, saving time and expensive labor. If the land is in a good state of cultivation, spread a good coating of rotten manure over the surface. Commence on one side of the piece, run a furrow from one end to the other, as deep as possible, returning empty. Go down the same furrow again, have two or three men stationed at intervals ready to step into the trench and throw out the loose soil from the bottom, for the reception of the next surface furrow. A continuance of the operation will invert the soil to a depth of eighteen or twenty inches, and at a cost of from ten to fifteen dollars per acre, and experience says it will pay from 50 to 100 per cent per annum.

Notwithstanding the great benefits resulting from trenching the ground, it is a fact that more than half the grapes are on land not trenched; hence there is no reason why every person with a small lot and smaller means should not raise this delicious fruit for their families.

If trenching is dispensed with, if your lot is small and only a few vines can be planted, you can economize space by enriching and digging deep a strip two feet wide on one or both sides of the garden walk. If both sides are used, a space of three feet should be left between the rows. If several rows are to be planted in a body, the whole piece should be enriched. The rows should be four feet apart, and if convenient, run north and south,—or better southeast and northwest, and the vines planted from four to six feet apart in the rows. But it may be well to bear in mind the fact that a row of vines of a given length will produce at the end of two years double the quantity of grapes with the vines planted four feet apart that the same length of row will with the vines planted six feet apart, while at the end of the fourth year there may not be any material difference.

For early bearing good two-year-old vines should be procured,—the best are roots pruned and transplanted the previous season. The planting should be done with the least possible exposure of the roots to the sun or drying wind, and may be either in the spring, from the middle of April to the middle of May, or in the fall, any time in October. If planted in the fall, a good covering of earth or other material for protection will be necessary, and must be removed before the buds start in the spring. The advantage in fall planting, if well protected, is the increased growth the first season.

If only a few vines are to be planted, get *all* the holes ready before planting; make the holes about eighteen inches in diameter, leaving the bottom (after well loosening the soil) six to eight inches deep at the center, and eight to ten at the circumference, and set stakes six to eight feet long just back of the center of the mounds. Examine your vines in a cool room or cellar; cut smooth the ends of short bruised roots, and cut the rest back to eight inches; repack the vines, covering them so that they can be taken out one at a time.

Every person planting young vines should do so on their knees. Place the crown of the roots on the center of the mound, spread the roots out evenly all around, cover them with two inches of fine rich soil, put on and pressed down with the hand. Fill up the hole to a level of two or three inches above the crown, with the earth taken out. An inch of well rotted horse or cow manure may be put on the surface. This will prevent leaking should it be necessary to water the vines. But no watering is ever necessary on any ground that has been trenched. Cut the cane back to two or three well-developed buds, and when the shoots from these have made a growth of six or eight inches, select the best one and cut off the others, as only one shoot must be allowed to grow

the first season. This must be kept tied to the stake, and the laterals, after making three or four leaves, must be pinched back to within one leaf of their base, and the sub-laterals the same. If, at the end of October, the vine has not produced a cane at least three feet long, it must be cut back to within three buds of the ground. But, knowing that any good two-year old vine will do better than that, we take it for granted that the cane is three feet long and upward, and should be cut back to within twenty-four or twenty-eight inches of the ground, carefully laid down in the direction of the row, and covered with four inches of earth, more or less. We have thus planted and brought one vine through the first season. The same rules and suggestions are applicable to hundreds as well as to one.

After the frost is out of the ground in the spring, and before the buds start, the stock we laid down in the fall must be taken up carefully and tied again to the stake. Rub off all the buds as soon as started, except the four upper ones. Two shoots, and but two, are to be grown this season. The reason for allowing four buds to make a short growth is this: If an accident happens to either of the upper ones, we can supply its place with the next below; but after the upper two are long enough to tie to the stake the danger is past, and the others may be rubbed off. If the vine grew strong last season it will produce four to six bunches of fruit this. The two shoots are to be treated the same as the single one of last season, by pinching off the laterals, etc., and at the end of August the tops of the shoots should be pinched off to make them more stocky, and to ripen the wood.

We shall have in October two canes ready for the formation of arms. If the vines were planted four feet apart, cut the shortest cane back to within four feet of its base for the lower arm, and the longer cane within six feet of its base for the upper arm. If the vines were planted six feet apart, the canes should be cut three and five feet respectively. If the ground is lower at one end of the row than at the other, commence at the upper end, laying the stock and canes down in the direction of the lower end, covering the first till you reach the second. Lay that down in the same direction, covering as before, and so on to the end of the row. As the stock in laying down overlaps the long canes, we must commence taking up in the spring at the opposite end of the row.

As soon as the frost is out of the ground the following spring, stakes four or five feet long should be driven into the ground fifteen or eighteen inches, six or eight feet apart, to which strips two and a half or three inches wide are nailed. The upper edge of the lower one may be twelve or fifteen inches from the ground, and the upper one three and a half feet. Three or four lengths of number 16 wire may be stretched from post to post, or lath may be nailed vertically on the strips to support the leaving canes. Some prefer number 8 or 10 wire to strips for supporting the arms, and small vertical wires for the leaving canes.

When fastening the vines to the trellis, bring the stock down in the direction indicated above, until the base of the short arm reaches the top edge of the lower strip or bar. Fasten with bark or twine. Lay the arm along the top and tie to keep in place. Now carry up the long cane, fasten it to top bar about twelve inches from a perpendicular, bring down the arm in the same direction as the lower one, and fasten with twine. Allow no shoots to grow except on the arms, and thin those to six inches apart by rubbing off the lower ones. If the requirements have all been complied with, we may expect nearly

one hundred bunches of grapes from every eight feet of a row thus planted, and double that quantity next season, and any person that can raise corn or cabbage, squashes or cucumbers, can thus raise grapes.

The foregoing suggestions are for the benefit of those who love grapes, but have never raised any, and are made with the view of summer pruning and laying down in winter. Summer pruning does not consist in removing the leaves as leaves, but in removing every superfluous shoot, and in repeatedly pinching or cutting the lateral and leaving canes. Grapes can be perfected without summer pruning, but the assertion is ventured that one-third more grapes can be perfected in a season in a given space with summer pruning than without it.

The thermometer having this winter indicated degrees of cold ranging from 30 to 40 degrees below zero, we are again admonished that winter protection is our only security. With this security, the grape is a more certain crop than any other, and on a small lot from two to four times as many pounds of grapes can be raised as of any other fruit.

If only one dollar can be expended for vines, get two Hartfords, one Delaware, and two Concords. If two dollars, add one Delaware, two Ionas, and two Concords. If five dollars, for variety, one Allen, one Martha, one Merri-mac, one Salem, one Adirondac, one Eumelan, two Hartford, two Diana, three Delaware, three Iona, and four Concord.

As this short paper is already too long, we must defer remarks on better systems for the amateur, and those with large lots and deep pockets; also as to what grapes to raise for wine, in connection with the temperance cause.

THE FIRST ANNUAL FAIR

or show of fruits and flowers was held in connection with Kent County Agricultural Society, on its grounds, on the 28th, 29th, and 30th of September, and 1st, 2d, and 3d of October, 1874.

The exhibition was a complete success, both as to quantity and quality of fruits and flowers on exhibition, and financially. Premiums were offered to the amount of about \$500. General satisfaction to all parties.

The officers of the fair were: C. N. Merriman, superintendent of pomological, assisted by Asa W. Slayton, of Saranac, in the fruit department, and Thos. Wilde, of Berlin, in the flower department.

OFFICERS OF THE SOCIETY FOR 1875.

Président—E. Bradfield, of Ada.

Vice-President—C. J. Dietrich, of Grand Rapids.

Treasurer—S. L. Fuller, of Grand Rapids.

Secretary—C. W. L. Dietrich, of Grand Rapids.

Executive Board—N. C. Merriman, John Suttle, Wm. Rowe, and Henry Holt, and *ex officio*, the President, E. Bradfield, the Secretary, C. W. L. Dietrich, the Treasurer, S. L. Fuller.

NORTHWESTERN FRUIT GROWERS' DISTRIBUTING ASSOCIATION.

The Northwestern Fruit Growers' Distributing Association was organized in Chicago, January 5th, 1875, at which time there was present about 400 of the leading fruit growers from Illinois and Michigan. The cause of the organization of this association, as set forth in the preamble to the constitution, is:

WHEREAS, The fruit-growing interest of the Northwest has assumed such magnitude as to require careful attention; and

WHEREAS, The plan which now exists for handling of fruit, from the grower, through its transportation and commission men, to the consumer, is attended with very small profit, if not an entire loss to the grower; and

WHEREAS, It is especially desirable to adopt some system whereby the grower may be better informed as to the supply and demand, and that said information may be spread before the people at as early a day as practicable, therefore we, the undersigned, unite, etc.

Article 2 of the constitution sets forth the object as follows:

Its object shall be to collect all possible information pertaining to the sale of fruit in the Northwest, and publish it in some suitable form for distribution to the members, to enable them to more readily reach a market for the products of their farms and gardens, and to make any other regulation regarding the sale of fruit deemed necessary and advisable by the association.

After adopting the constitution, of which the above is a part, the following officers were elected:

President, Dr. M. M. Hooton, Centralia, Ill.; Vice Presidents, A. S. Dyckman, South Haven, Mich., T. P. C. Lane, Mattoon, Ill., W. P. Robinson, Carbondale, Ill.; Recording Secretary, O. S. Willey, Benton Harbor, Mich.; Assistant Secretary, T. A. E. Holcomb, South Pass, Ill.; Corresponding Secretary, W. C. Flagg, Moro, Ill.; Treasurer, O. E. Moore, Chicago, Ill.; Ex. Committee, W. Corner, Fennsville, Mich., — Galbreth, Jeffersonville, Ill., Prof. Barler, Alton, Ill., A. R. Nowlan, Benton Harbor, Mich., S. P. Bingham, Makanda, Ill.

February 25th Mr. Moore resigned the office of treasurer, and the ex. committee elected T. D. Randall, of Chicago, to fill the vacancy, who has accepted the trust and filed his bond with the secretary.

The Executive Committee found that the chief difficulty in the way of perfect unanimity between grower and seller, arose from a lack of confidence in each, or, in other words, while there are many of both classes who aim to do a straightforward and upright business, and are entitled to the confidence of all, still the great number of fraudulent shippers and sellers makes it necessary to throw about both certain restraints. As a safeguard to both, the Executive Committee, at a meeting in Chicago, February 24th, 1875, adopted the following rules:

SPECIAL RULES.

First, The fruit sellers in this Association shall be organized into a Guild, which shall consist of not more than one section in each town or city.

Second, Any member of the General Association may become a member of the Guild (if he sustains a good reputation for honesty and fair dealing, and is responsible for all liabilities likely to be incurred), under the rules hereafter prescribed.

Third, Sections may be organized in any city or town where suitable members may be found, who are willing to enter into the organization, in the same manner as is prescribed for the city of Chicago.

Fourth, In the city of Chicago the Executive Committee of the General Association shall designate a number of commission merchants who have been well tried, and have proved competent and reliable, who shall enter into an organization, with President, Vice President, Secretary and Treasurer, who, together, shall constitute an advisory committee, and their several duties shall be as hereafter set forth.

Fifth, All applications for authority to organize sections of the Fruit Distributors' Guild shall be made to the President of the General Association, and shall be approved by the officers before the organization shall be valid: *Provided moreover*, That, by a unanimous vote, the Executive Committee may authorize an agent to organize sections of the Guild, to be afterwards approved.

Sixth, All applications for membership in any section of the Guild must be made to the Secretary of the section, and be approved by the Advisory Committee, before it can be voted on by the section, after which, a two-thirds vote may admit to membership. But the application shall be made at the regular meeting previous to the one at which final action is taken, and the vote shall be by ballot.

Seventh, All applications for membership shall be accompanied by a fee of \$— for each member of the firm, or for each person applying, and an annual fee of the same amount shall be paid: *Provided*, That no one firm shall have more than two memberships.

Eighth, The President and Vice President of each section shall perform the duties usually devolved on such officers in like societies.

Ninth, The Secretary, in addition to the ordinary duties of his office, shall promptly report the name and postoffice address of each person or firm admitted to membership, and shall collect and forward with said name to the Secretary of the General Association, the sum of two dollars for each person so admitted, as the membership fee to the General Association, and shall also collect and forward the annual dues, on the 1st day of January of each year, or as soon thereafter as possible.

Tenth, The Treasurer shall receive and safely keep all money of his section, and shall pay out the same only as directed under the rules of his section.

GENERAL RULES.

First, Any member or members of this Association who shall be guilty of dishonesty, or shall knowingly violate the laws of fair dealing, either as consignor or consignee, or who shall fail to promptly pay the proceeds of sales to consignors, or who shall make false representations in regard to sales of fruit or other produce consigned to them by any member of this Association, shall be suspended, expelled, or otherwise punished, as his section or the General Association may consider just after a full hearing.

Second, Whenever any member or members are guilty of any misdemeanor referred to in the foregoing section, he or they shall be forthwith reported, with all the facts in the case, to the President of the General Association, who shall cite them, if members of the Guild, to their section for trial,—if members of the General Association *only*, to the nearest member of the Executive Committee, who shall call in two members to sit with him in the trial of the case, and who shall promptly report the result of their investigations to the President for his approval.

Third, All charges against any member shall be made in writing, and shall be open to inspection by the accused or his counsel.

Fourth, Whenever any member of the Guild is suspended or expelled, the Secretary of the section of which he was a member, shall immediately notify the Secretary of the General Association, who shall forthwith notify every fruit shipper in the Association.

Fifth, All members of the General Association found guilty under these rules shall be suspended, expelled, or otherwise punished, and each section of the Guild forthwith notified of the action.

Sixth, Any member not satisfied with the result of any investigation herein provided for, shall have the right of appeal to the General Association at its next annual meeting. But if the sentence involves expulsion, the notice shall be given of the sentence and of the appeal, the same as if final.

Seventh, Concealing rotten or gnarled fruit in the middle of a package, and covering the outside with fair fruit, shall be considered *prima facie* evidence of dishonesty in all investigations under these rules.

Eighth, Any section of the Guild may make such rules for its own government as a majority of the members may desire, not in conflict with these rules, or the constitution and by-laws of the General Association.

Ninth, All transactions of the several officers of this Association involving the expenditure of money, must first be ordered by the General Association, or by the Executive Committee, unless it be in the discharge of the special duties of his office.

Tenth, All fruit shipped by the members of this Association shall, as far as possible, be strictly graded, as follows: *First*, Good, which shall have none but sound fruit in it, and shall be strictly of the same general grade throughout the package: *Provided*, That some of the very finest may be denominated *fancy*. The second grade shall be constituted of such *fair* fruit as will pay for shipment, but which is not guaranteed perfect, although it is entirely sound.

Eleventh, On all of first grade,—“good” and “fancy,”—the shipper’s name is to be put on each package in plain letters, and is a guarantee of its perfection or the sale is invalid.

Twelfth, All of second grade is to be sent into market without brand, and sold on its merits. But, in all cases, all parts of the package is to be of the same class of fruit throughout.

With these special and general rules as a guide or basis of action, the Executive Committee met with twenty-four of the leading commission firms on South Water street, and organized a “Fruit Board of Trade or Guild,” which the Association will endorse. It is proposed to organize similar boards in all the principal towns in the Northwest, as fast as the officers appointed can accomplish their work. A list of these boards or guilds, with the names of the men composing them, together with the list of members (fruit growers) of the Association, will be published in pamphlet form for the benefit of the members. It is expected to have the pamphlet ready for distribution by May 1st. Michigan ought to have 1,000 members, and Illinois as many. Mr. H. H. Garland, of Benton Harbor, was appointed to solicit memberships for this vicinity, Benton Harbor, and M. Maxon at St. Joseph. We trust no time will be lost, but that every one who is interested in fruit growing will forward to Mr. Garland, or hand to one of the officers, the membership fee, only \$2, with his name.

O. S. WILLEY,

Recording Secretary.

Benton Harbor, Mich.

REPORT OF MEETINGS—1874-5.

THE OCTOBER MEETING AT SPRING LAKE.

The meeting of the State Pomological society at Spring Lake, which commenced on Tuesday, October 6th, 1874, was a very interesting one, with President Dyckman in the chair. The attendance was fair, and the show of fruit was very good. Spring Lake took the lead in the exhibition, and her show of fruit elicited much commendation. Especially did the exhibition of Baldwin apples by Walter G. Sinclair receive the plaudits of the audience. The display of grapes was especially fine. There was a table, also, well loaded with vegetables.

On Wednesday Secretary Thompson spoke of the exhibition of apples from Grand Traverse, grown in the township known as "Peninsula," a strip of land twenty miles long and two miles wide, between two arms of Traverse Bay, on which scarcely a rod of land could be found not adapted to fruit culture. Mr. Thompson exhibited the Northern Spy in perfection. It was the apple that took the first premium for the best winter apple at the state fair. The characteristics of the Grand Traverse apples are hardness, solidity, and fine color, as shown by the specimens of Cayuga Redstreak, Fallawater, and Hawley. The Baldwin appeared in two distinct samples, so unlike as to be scarcely recognizable, the difference arising from difference of location or soil. Mr. Thompson said that another apple was on exhibition that did not look like a Rhode Island Greening, and yet it was. They will have to get up a new descriptive catalogue in Grand Traverse. A plate of peaches here shows that even at Grand Traverse the peach can be successfully raised in latitude 45° north. Pears also appear here in perfection, as shown by samples of Louise Bonne de Jersey. Grapes are also grown there successfully. Judge Ramsdell sends from his vineyard on "Mount Ramsdell" fine specimens of the Agawam (Rogers 15), the Wilder, Israella. At the state fair, Grand Traverse had summer apples in perfection, and Peninsula township took the first premium on township collection of apples at that fair,—the first time it had competed for that honor. Traverse is also an excellent country for general farming, and Mr. Marshall has a farm well stocked, which produces wheat and farm crops in abundance.

Mr. Soule inquired whether the codling moth was troublesome in that section, as he saw its marks on the apple.

Mr. Parmelee said in the new orchards it had not yet appeared, but in the old ones it is becoming troublesome.

Secretary Thompson read a report from Benton Harbor. Fruit crops are generally good. Strawberries, full crop; raspberries, good, but not abundant;

blackberries, good; apples, fine quality and large quantity; plums, better than for many years; quinces, better than last year; peach crop better than expected at the beginning of the season; early peaches rotted badly; later varieties first-rate quality. The total shipment of fruit this season is 560,118 baskets and packages. The First National bank of St. Joseph has paid out over \$100,000 this year to fruit growers; and Hopkins & Jackson, of Benton Harbor, have paid as much more.

Mr. S. W. Fowler, of Manistee, furnished a report stating that the interest in fruit growing is constantly increasing in Manistee. Fruit trees are being planted in all parts of the county, and it is rare to see a log cabin without a fair prospect for an orchard. Apples are not wormy, and no insect troubles any description of fruit as far as heard from. The plum is especially free from the curculio.

M. Charles E. Soule read a report from Spring Lake. The year of 1874 had been by far the most cheering and successful year the fruit growers in Spring Lake and vicinity have known since their attention has been called to this branch of husbandry. The crop of berries was shortened by the drouth of June and July; but this did not seriously affect the fruit growers, their main dependence being on peaches, which yielded largely and were of the finest quality. They sold at good remunerative prices. The drouth affected the Hale's Early and Yorks, except where well cultivated and thinned. The rains of August and September brought the Barnards and Early Crawfords along in their season in greater quantity and of higher excellence than ever known. The Early Crawford is the most extensively grown variety. The average price netted has been about fifty cents a basket, or \$2 a bushel. The season demonstrated the necessity of thinning all varieties except the Early Crawford. Grapes have been, as usual, a heavy crop. The orchards are going into winter in fine condition, with a prospect of a large crop in 1875.

Mr. D. R. Waters read the following report, prepared by James A. Cross of Spring Lake:

SMALL FRUITS.

I have 1,500 hills of Doolittle Blackcap raspberries under cultivation; also 400 hills of other cap varieties, comprising Davison's Thornless, Miami, Seneca and Mammoth Cluster. Of red raspberries I cultivate but one variety, the Philadelphia, of which I have 2,600 hills now in bearing from five to seven years. I have besides 2,000 set a year ago last spring. Nearly one-half of these bushes are planted among peach trees that are planted sixteen feet each way, with rows of berries between,—the black planted four feet apart and the red two and a half feet apart in the row.

Berries among peach trees appear to do as well as those not among them, but I think the trees do not do as well, especially when planted but sixteen feet apart. Twenty feet would do better.

My berry crop this season was nearly a failure. The vines were in good condition this spring, and set well for fruit, but owing to the drouth but a small portion came to maturity. I harvested 36 bushels this year, including the new plantation, against 176 bushels the previous season from the old plantation alone. Net receipts this year, \$144 84. Net receipts last year, \$525.

I ship my fruit in quart boxes in crates of half a bushel. The first part of the season Milwaukee is the best market, the latter part the best prices are obtained in Chicago.

I consider the Philadelphia more profitable than any of the black cap varieties.

I have three-fourths of an acre of strawberries under cultivation. They came out of the winter and through the spring in poor condition, in consequence of freezing and thawing when the ground was bare of snow. Of this fruit I only marketed 32½ bushels, from which I netted \$121 47.

I have of grapes one acre in bearing, consisting of varieties as follows: Concords, 300; Hartfords, 200; Ionia, 100; Delaware, 40. The Concords and Hartfords bore about same amount per vine; Iona bore small crop and ripened well; Delawares fair crop. I consider Hartford Prolific the most profitable grape. I raise as they come into market first and they

bring from 8 to 12 cents per pound, while the Concord rarely brings more than 6 cents, and often less. My whole crop of grapes amounted to 5,000 pounds, for which I netted \$160 20.
J. A. CROSS.

From Grand Haven Mr. H. S. Clubb reported that this had been the most productive season for peaches. Other fruits, except grapes, are less than an average. Apples are not abundant, and what there are injured by the codling moth. The fruit harvest, on the whole, has been profitable. Most were shipped to Milwaukee. Grapes were crowded on the market and brought down the price.

Mr. Clubb next spoke of the yellows at St. Joseph and Benton Harbor, stating that the spread of the disease had been checked by destroying trees as soon as found to be affected. Notwithstanding the ravages of the disease, very large shipments of peaches had taken place at St. Joseph and Benton Harbor, the region, as a whole, being only partially affected.

A discussion then sprung up on the freight question, during which President Dyckman said that high rates could have been prevented by united action, had it been known that there would be so large a crop. South Haven could unite with Saugatuck and charter a steamer. Some such action will be taken next year.

Hon. T. E. Gidley read a paper describing Peach Plains as lying south and east of the city of Grand Haven and adjoining the city limits, and two to four miles from the lake shore. Some thirty families are now settled there, with improvements generally of from ten to twenty acres, mostly set to the peach, with a liberal sprinkling of pears, apples, cherries, and plums. Strawberries, raspberries, and blackberries have been largely set, received proper attention, and been found very remunerative.

Mr. N. E. Smith reported from Ionia county that peaches are very fine when well attended to. Our apples were a large crop. They continued dropping until the first of August; after that time they ceased dropping. They are mostly a light crop this year in Ionia county. We have a good crop of grapes. They had escaped the frost up to the 12th inst.

Mr. H. Dale Adams, from Kalamazoo county, reported as follows: In Kalamazoo our early tree fruits were very fine. Cherries were an excellent crop. Cherries in our section seem better than in other parts of the State, such as Dukes and Bigarreaus. We are very little troubled with the curculio. Plums are very little grown. Although not a peach-growing county, Kalamazoo produced about enough this year for home consumption. The pear crop is made something of a specialty in the vicinity of the village of Kalamazoo, and that fruit is remarkably fine this year. Of grapes the Delaware and Concord are the principal vines in cultivation; Ionas are raised some, and a new grape known as the "Kalamazoo," which, however, is not thought much of. Apples in cultivated orchards are generally fine. Orchards suffered severely from drouth, and were injured by the codling moth.

Henry Holt of Cascade, Kent county, said: The winter of 1872, nearly destroyed our orchards of peaches, pears, and even apples were seriously injured. On cutting off limbs I found them brown clear to the bark. So general was the devastation that we feared our orchards were spoiled. But two years' experience show that this wood did not decay, and new wood has been formed, and we think the trees are not going to die. Some need shortening in. Some varieties of apples stood the cold well,—Peck's Pleasant, Talman's Sweeting, and some other varieties. We have a fair crop of apples this year.

Secretary Thompson said that the peach crop in Kent county is larger than ever before, notwithstanding we were struck two years ago with frost. We thought then we were never going to have any more fruit, but we have had this year a fair crop of apples and a large crop of peaches for that county.

A paper by Mr. S. B. Peck of Muskegon was then read by Mr. Whitney, on the "Insect Pests."

Mr. Geo. Parmelee of Grand Traverse read a valuable paper on the cultivation of the cherry, in which he condemned the cherry bird and the importation of the English sparrow.

The various awarding committees then made reports.

Mr. Geo. Parmelee then spoke for over two hours on "Chemistry vs. Experience," and was listened to with the closest attention. His theory is that plants receive their nourishment in a gaseous rather than solid form, upsetting the doctrine of Liebig that certain plants needed to be fed with soil containing, by analysis, precisely the same element as the plants contained.

A vote of thanks was tendered the officers and members of the Spring Lake Horticultural Society for their hospitalities.

The annual meeting of the society is to be held at Ionia, on the second Tuesday in December. The society then adjourned.

THE ANNUAL MEETING AT IONIA.

The annual meeting, for 1874, of the Michigan State Pomological Society, was held at Ionia, the county seat of Ionia county, on the invitation of the officers and members of the Ionia County Agricultural Society. This flourishing county society has the following

OFFICERS FOR 1875.

President—G. W. Webber, Ionia.

Secretary—H. C. Sessions, Ionia.

Treasurer—J. W. Loomis, Berlin.

Board of Directors—E. P. Kelsey, Ionia; N. B. Hayes, North Plains; D. H. English, Boston; D. T. Hoyt, Ronald; W. A. Inman, Easton.

Marshal—A. F. Kelsey, Berlin.

Division Superintendents—Wm. S. Bates, A. Alderman, Henry F. Hubbell, A. B. Culver, G. A. Willett, H. G. Wright, C. E. Rust, James H. Kidd.

THE FAIR GROUNDS

are located on the north bank of Grand river, within the limits of the city of Ionia, and have been enlarged from twenty to thirty-five acres, and when not used by the society, are under the supervision of the Ionia Park Association, composed of some of the most liberal of the citizens of the city of Ionia. The association purchased the fifteen acres added to the old grounds, and made the Agricultural Society a present of it, and it is laid out into beautiful drives and walks; one drive along the entire river front is one of the most beautiful in the State. The new grounds are shaded by native forest trees, with a thick matting of grass underneath; which, with its drives and walks, render it a very fairy land.

PROCEEDINGS OF THE ANNUAL MEETING.

The annual meeting of the Michigan State Pomological Society opened on Monday afternoon, December 2, 1874, at the Circuit Court room in Bayard's Block, with a good attendance from abroad and of residents of Ionia county.

The society was called to order at two o'clock by President Dyckman. The following committees were appointed:

On Apples—T. T. Lyon, S. Haven; D. T. Fox, Kalamazoo; Lyman Hall, Spring Lake; H. B. Chapman, Reading; Jas. W. Loomis, Ionia.

Other Fruits and Wines—Wm. Rowe, Kent Co.; H. W. Curtis, Grand Traverse; E. P. Kelsey, Ionia; N. Chilson, Battle Creek; R. F. Johnstone, Detroit.

Flowers—Prof. Beal, Lansing; H. Dale Adams, Kalamazoo; Mrs. H. B. Chapman, Reading; Mrs. F. Hall, Ionia; Mrs. J. W. Loomis, Ionia.

The secretary read some papers relating to the centennial exhibition at Philadelphia. The following were appointed a committee of arrangements in regard to the matter:

Professor C. L. Whitney of Muskegon; Secretary Thompson, T. T. Lyon, S. O. Knapp, Professor Holmes, of Detroit, and Perry Hannah of Traverse City.

Peter Sneathen of South Boston presented a report on crops, which, in his section, were good in all respects. He thought the best preventive for the operations of the codling moth was a band of dark fulled cloth around the trunk of the tree.

George Parmelee read a very interesting paper on the "Nomenclature of Fruits Exhibited at the last State Fair."

George Hosford of Ionia read a paper on the "Introduction of Concord Grape Culture in Ionia County."

IONIA, Mich., November 28, 1874.

I am asked to prepare a few facts relative to the introduction of the Concord grape in Michigan. In complying with this request I would say: I saw the first published account of the origin and qualities of this excellent grape, and subsequently saw reports of committees respecting it. I thought it might do as well in Michigan as in Massachusetts, and resolved to give it a trial if possible. In the spring of 1854, I think, I saw Hovey & Co.'s advertisement offering for sale a few one-year-old Concord plants at \$40 per dozen, or \$5 apiece.

I sent an order directly, with pay for one vine. In a few days I received an answer acknowledging the receipt of the money, saying also that as soon as it would do to take up the vine it would be forwarded. It arrived in due time, in a good condition. I paid Mr. David Irish, express agent at Ionia at that time, two dollars charges. I took my seven-dollar vine home and planted it. The third year it produced a few very fine clusters of fruit. I felt quite proud of my treasure, and showed it to my friends and neighbors, but got no word of sympathy or cheer. People said, "Fool and money parted," "hazardous enterprise," and many other remarks were made of a similar import. But all these things had no power to discourage me. I braved many discouragements for years, trying to establish a reputation for this fruit, and by persistent efforts did finally succeed in this locality. Many others are equally interested now; and a few years will develop an interest in this direction that will be second to but few others in the State.

This, in brief, is a correct statement as near as I am able to give in relation to this subject. I now have seven acres in grapes bearing. I sold ten tons of fruit and made 280 gallons of wine this year, 1874; net, 5½ cents per pound.

GEORGE HOSFORD.

THE BEST CHERRIES.

The committee appointed to report on the best cherries for cultivation in this State, submitted the following:

IONIA, Dec. 3, 1874.

The committee appointed to report a list of cherries for cultivation, in performing that duty would at the outset state two facts: First, the number of varieties of cherries that have been well proved in this State is not large; and again, we are not in favor of naming

a variety that has not earned for itself a good reputation in some section of this State. This, of course, will rule out many kinds that have a good name in some places out of the State, and we would not assume that we have not passed over some variety which by our own rule should be in our list, which is as follows:

For hardy varieties we would recommend Kentish or Early Richmond, English Morrello, Reine Hortense, May Duke, and Belle Magnifique.

For localities where less hardy sorts are considered safe, we recommend Early Purple Guigne, Elton, Yellow Spanish, Rockport, Black Eagle, Knight's Early Black, and Black Tartarian.

GEORGE PARMELEE
(of Old Mission),
Chairman.

In the discussion that followed, Mr. T. T. Lyon objected to recommending the Black Tartarian, but several members sustained its character, and the report was adopted.

A report was received from the office of the Secretary of State, giving statistics of fruit crops in 1872-73. A vote of thanks was tendered Mr. Hasty, Deputy Secretary of State, for this report.

In the evening George Parmelee delivered an interesting address on "Air, the Source of Fertilization to Plants." The speaker believed not only that air has more to do with enriching the soil and aiding the growth of vegetable life than is generally supposed, but more than any other agent.

Prof. C. L. Whitney, of Muskegon, spoke eloquently of agricultural societies and the grangers; gave a history of agricultural societies in Michigan, and dwelt upon their importance. He thought the county fairs to be the ones of true value to the mass of farmers.

SECOND DAY'S PROCEEDINGS.

Meeting called to order at 9:30 A. M. The invitation of Mayor Webber to visit the proposed site of the intermediate prison was accepted. On motion an invitation was extended to the city schools, to attend the lectures of Professors Beal and Cook.

The Secretary announced the death of Joseph Gridley, a member of the society. The following committee on resolutions of respect was appointed: Messrs. Ilgenfritz, Knapp, Sterling, Dickinson, and Clubb.

President Dyckman then delivered a brief valedictory address, recounting the success of the society and showing its future prospects.

The Treasurer, Henry Seymour, then presented his annual report. This was followed by the Secretary's report.

On Wednesday at 11:30 the society adjourned to visit the prison site, a number of carriages having been provided. Visitors generally expressed their warm approval of the site chosen, its proximity to railroads and town, the water supply and elevated location impressing them favorably.

WEDNESDAY—AFTERNOON SESSION.

At the hour appointed a good audience was assembled to hear the lectures, the number of which was shortly increased by the entrance of a school delegation of 150, headed by Principal Ewing and his assistant. The president announced the subject of the first lecture, to be delivered by Prof. Wm. J. Beal, of the State Agricultural College, on "How Plants Grow."

"The Codling Moth" was the title of the next lecture, by Prof. A. J. Cook, and it was a subject in which all apple-growers now take a very deep interest.

Both these lectures were very interesting, being illustrated on the black-board, and containing much information of practical importance.

The display of fruit is said to have been one of the finest in the history of the society. There were 320 plates of choice fruit on exhibition. Grand Traverse is especially well represented, and the high color of the fruit grown there is very noticeable.

The display of flowers was not large, but still added very much to the appearance of the room. Among the exhibitors were Mrs. F. Hall and E. LeValley, Ionia, and J. Suttle, Grand Rapids.

BOTANICAL NOTES.

One of the most valuable and learned papers read at the meeting was by Mr. Charles F. Wheeler, of Hubbardston, on "Random Botanical notes, Historical and Otherwise." After some remarks on the progress of the science in general, he gave a sketch of the work done in investigating and cataloguing the plants of Michigan. The first contribution of note was made by Drs. Douglas Houghton and Zina Pitcher to a "Synopsis of the Flora of the Western States," by Dr. John Riddell, of Ohio, published in 1835. In 1837, an act authorizing a geological survey of the State was passed, and approved by Gov. Mason, and the survey was reorganized by a second act in 1838. At this time Dr. John Wright had charge of the botanical department, Dr. Abram Sager, of Ann Arbor, being State Geologist. About 30 years ago Prof. Geo. P. Williams, the first resident professor of the University at Ann Arbor, made a good collection of native plants at Pontiac, embracing about 100 orders. This collection is now in the possession of Miss Mary H. Clark, of Ann Arbor, and has been increased to about 2,000 species.

The next considerable contribution to the catalogue was made by W. D. Whitney, of the Lake Survey, published in "Whitney and Foster's Reports" in 1850 and 1851. The next list in the order of time was that of Prof. N. H. Winchell in 1860, based on Wright's previous list, the notes of Miss Clark, of Ann Arbor, who, in 1850, contributed to the Washtenaw County Whig a "Description of the Plants Indigenous to Ann Arbor and Vicinity," which appeared in 16 consecutive numbers of that journal. Since the catalogue of Prof. N. H. Winchell but little has been done except by individual botanists. Distinguished among these is a former resident of Ionia county, Mr. J. B. Steere, who has been traveling abroad for the last four years, making a collection in natural history for the museum of the State University. He is now in the Phillipine Islands.

Mr. Wheeler gave a somewhat minute account of the topography and botany of Portland and vicinity, Ionia county, which is situated on the southern border of the pine region, and is, he thinks, representative of a large section of the central part of the State. Within this region he had collected over 700 species of plants, of which 650 are flowering plants, including grasses and sedges, belonging to 340 genera and 94 orders. Of the lower orders the ferns yield 27 species belonging to 12 genera, scouring rushes and club mosses furnishing 8 species and 3 orders. There have been identified 25 species of mosses and liverworts. Only 78 species reach the dignity of trees. Of shrubs and under shrubs there are 72 species. Fifty-four species of plants have been introduced with civilization, mostly domestic plants or carpet-baggers, common weeds and garden pests. The struggle between the native and introduced plants is an

interesting subject for study. In the vicinity of Matherton, for instance, the wire-grass—*Elyusine Indica*—which has come all the way from India, has driven out nearly all other species of grass, covering the roadside as with a carpet.

The writer made a plea for the cultivation of native shade and ornamental trees, as being in many respects better than the foreign ones introduced for that purpose. He commended as especially deserving of cultivation the blue ash, Kentucky coffee tree, black sugar maple, and corky white elm, and among shrubs the wahoo, American bladder-nut, the varieties of the service or shad-bush, choke-cherry, snow-ball, flowering dog-wood, and American crab-apple. Among the climbers he made favorable mention of the ampelopsis, climbing bittersweet, moonseed, clematis, and varieties of green briar. The writer also mentioned the native wild-flowers, describing the appearance and beauties of several of those better known.

In conclusion, Mr. Wheeler made an urgent plea for a more general and thorough study of botany in general, and of the native plants of Michigan in particular. There is no lack of text-books, and the materials for a successful prosecution of the study are abundant and inviting upon all hands.

WEDNESDAY—EVENING SESSION.

IONIA, Dec. 4, 1874.

The Pomological society met last evening, the attendance being quite large. The first business was the election of officers for the ensuing year, but after more than an hour spent in a vain effort to elect a president, the whole matter was postponed.

Hon. Alonzo Sessions was then introduced, and delivered a brief address upon the subject of "Wheat Culture in Ionia County." After giving a condensed history of its early cultivation, noticing the hardships and disadvantages under which agriculturists then labored, the speaker stated that wheat had been raised in the following order: First, Red Chaff, an almost worthless variety; second, Flint, which was a very nice white wheat, producing well, and manufacturing a large proportionate amount of flour; the Soule was next in order, and was a decided favorite both with the farmer and manufacturer, and retained the preference until the appearance of the midge, which nearly destroyed the entire crop, and in this locality this variety had almost entirely disappeared. The Treadwell and Hutchins had been tried only to be abandoned as unsatisfactory. The variety that experience has proved to be best is the Diehl, which, when sown early on well prepared ground and with favorable weather gives satisfactory results. The speaker recommended early sowing on well cultivated ground. The main dependence of the farmer is his wheat crop; it furnishes his supplies, if he has any, generally speaking. With the improved methods of cultivation wheat could be raised at a small profit, even at present prices, with favorable weather.

THE CENTENNIAL.

Prof. J. C. Holmes, of Detroit, in behalf of the committee on the Centennial Exhibition, reported the following:

Resolved, That the Michigan State Pomological Society deem it expedient to exhibit horticultural products at the Centennial Exhibition to be held in Philadelphia in 1876, provided a sufficient amount of funds can be raised to meet the necessary expenses.

Resolved, That the society extend an invitation to local horticultural societies to co-operate with it.

The report was adopted without debate.

RESOLUTIONS OF RESPECT.

Mr. H. S. Clubb, of Grand Haven, chairman of the committee, reported resolutions of respect for the late Joseph Gridley, of Kalamo, Eaton county. The report was adopted unanimously, and a copy ordered sent to the bereaved family.

Prof. J. C. Holmes then read a historical sketch of the organization of agricultural societies in Michigan.

EXPERIMENTS.

C. W. Garfield, of the Agricultural College, spoke briefly of certain horticultural experiments. The first was with the crossing of different varieties of apples. Talman Sweet crossed with the Wagener gave an apple inferior both in taste and color to either of the originals. But the result of a cross between the Talman Sweet and Red Astrachan was an apple both brighter in color and richer in flavor than either of the originals. The crossing was effected by the artificial application of the pollen.

Experiments were also made in planting potatoes at various depths, from six inches below the surface to six inches above, that is, upon the top of little sand banks. The average product of those beneath the surface was not materially different. In those above the surface there were far more settings, but they were very small potatoes. One section was planted with the tops of the potatoes about one-third in each case, and another section with the remaining stem ends. The yield of the latter section was considerably the larger of the two. One section had the vines pruned and those of another left unpruned, and the yield of the former section was the greater. The section contained six hills each, and all the other conditions were the same. Experiments were also made with bean vines to make them wind about the poles the wrong way, but without success. It was found that the vines would die first.

THE NEXT FAIR.

Mr. H. Dale Adams moved that a committee of not less than three be appointed to confer with the Executive Committee of the State Agricultural Society, relative to holding another union fair by the two societies. The motion prevailed, and the President subsequently named as such committee H. Dale Adams, of Kalamazoo; S. O. Knapp, of Jackson, and Geo. W. Webber, of Ionia.

After some further interchange of opinion, the society adjourned to nine o'clock Thursday morning.

ELECTION OF OFFICERS.

On reassembling Thursday morning, a second and successful attempt to elect officers was made, with the following result:

President—George Parmelee, Old Mission.

Vice Presidents—One from each county in the State.

Secretary—J. P. Thompson, Grand Rapids.

Treasurer—Henry Seymour, Grand Rapids.

Members of Executive Committee—W. L. Webber, East Saginaw, and E. R. Waters, Spring Lake.

The president announced the following as the committee on resolutions: R. F. Johnstone, H. P. Hanford, and Edward Bradfield.

On motion the following were appointed to attend the meeting of the Western New York Horticultural Society, at Rochester, January 10th: J. C. Holmes, Detroit; T. T. Lyon, South Haven; C. P. Avery, Old Mission; H. P. Hanford, Bristol, Ind.; A. S. Dyckman, South Haven.

Prof. J. C. Holmes presented an invitation from the State Poultry Society to join with them in the January Exhibition at Detroit, but it was not thought advisable to accept the offer.

Mr. H. D. Adams, of Kalamazoo, in behalf of the orchard committee, read a report of the travels of that committee to the different parts of the State the past season, and what they saw and thought of each orchard.

Prof. Beal, in behalf of the people of Lansing and vicinity, invited the society to hold its February meeting in that city, and the invitation was accepted.

An amendment to the constitution was proposed by Mr. Bradfield, providing that every officer of the society, including vice-presidents, must be a member of the society. Laid over for future action under the rule.

ADDRESS BY MR. CHILDS.

The Hon. J. Webster Childs, of Ypsilanti, addressed the society at length on "The Agricultural Wants of Michigan." It was interesting and attentively listened to throughout. He spoke of the necessity of a more general and thorough education of farmers in matters relating to their business. Fathers are too apt to educate those sons who enter mercantile pursuits or professions, and leave those who are to carry on the farm the mere rudiments of an education. From this it has come to pass that a system of caste has sprung up and farmers are supposed to occupy a lower social plane. They have the remedy in their own hands.

Recurring to political topics, he urged attendance upon the primary meetings as the surest way by which farmers could secure a fuller representation in the halls of legislation. All they ask is an equal chance with all other classes of the community, and that chance by the help of God they meant to have. It may be all right that out of a Congress of 300 members 248 should be lawyers. Some people think so, but the farmers are beginning to doubt it. They are beginning to wonder whether they might not spare five or six lawyers, and still have enough left. [Applause.] That the farmers have not had equal representation is their own fault. They are beginning to realize that great fact, and beginning to organize, and thank God 2,000,000 farmers are now marching shoulder to shoulder and keeping step to the music of equal and exact justice to all.

Mr. T. T. Lyon read an elaborate paper on "Plums and Plum Culture," and Mr. H. S. Clubb on "The Characteristics of the East Shore of Lake Michigan."

RESOLUTIONS ADOPTED.

Mr. R. F. Johnstone, in behalf of the committee on resolutions, reported the following, which were adopted:

WHEREAS, The Michigan State Pomological Society was instituted for the purpose of promoting and disseminating a more correct knowledge of fruit-growing, for correcting fruit nomenclature, and to add to and develop the rich resources which Michigan possesses in her soil and climate, and her geographical position in connection with pomology; and

WHEREAS, In pursuance of these purposes it has been found that amongst the duties of this society there were none more useful or more thoroughly adapted to work into the minds of the fruit-growers and all interested in pomology and the other branches of horticultural science, a practical and extended knowledge of fruits and their nomenclature, of arbori-

culture, of plant culture, of landscape and ornamental gardening, and a correct and cultivated taste in all that enriches and adorns the State and the homes of the farmers and other citizens, than the holding of its meetings from time to time in the several cities and villages easily reached by the surrounding population; and

WHEREAS, The State Pomological Society has for the first time held one of its meetings in the city of Ionia; therefore,

Resolved, That the hospitalities and attention shown by the citizens of Ionia to the society have done much to promote the objects and designs of this organization, and that our sincere acknowledgments are extended to them for their very important aid in affording all the facilities required to render the first meeting in Ionia a convention of the fruit interests that will do much to increase the beneficial influence of the society.

Resolved, That in affording to the members of the society an opportunity to inspect the location selected for the State house of correction, we have had the satisfaction of surveying sixty acres of land well adapted to the purpose for which it has been selected, the tract rising high and rolling in surface above the valley of the Grand Rapids, and well situated between great trunk railroads to give it all the facilities of access necessary for such a State institution.

Resolved, That the thanks of the society are tendered the reporters of the press for the very correct and extended reports, which aid the society in extending its influence and in promoting a correct knowledge of its work, its action and its aims.

Resolved, That the aid afforded this society by the State agricultural college through its several professors, in adding to the interest and instruction of the several meetings, deserves the thanks of the members, and should receive our special acknowledgment as evincing the practical utilities of this educational institution in connection with an important department of culture for which it was established.

There were also resolutions of thanks to Hon. George W. Webber, the mayor of Ionia, to W. D. Arnold, secretary of the Ionia county agricultural society, to the city cornet-band, which favored the society with music, and to the exhibitors of fruits, flowers, etc., at the meeting. To these the reporter wishes to add a special resolution of thanks to Messrs. Le Valley and N. E. Smith of Ionia, for their industry in keeping the reporter's table supplied with apples and grapes of their own raising and of the choicest varieties.

REPORT OF THE COMMITTEE ON APPLES EXHIBITED.

	No. Varieties.
N. and C. Chilson, Battle Creek.....	40
C. J. Freeman, Ionia.....	14
G. W. Dickinson, Grand Rapids.....	3
James Mickel, Ionia.....	3
Porter Smith, Palo, Ionia Co.....	3
Wm. Steere, " " ".....	17
M. W. Alverd, North Plains, Ionia Co.....	9
E. Le Valley & Son, Ionia.....	17
Geo. W. Webber, Ionia.....	1
Peninsular Farmers' Club, Grand Traverse Co.....	35
P. D. Sneathen, South Boston.....	19
S. T. Dexter, Ionia.....	15
W. H. Mattison, Ionia.....	14
Wm. Rowe, Walker, Kent Co.....	7
H. A. Culver, Orange, Ionia Co.....	25
Geo. Hosford, Ionia.....	2
D. B. Smith, Portland, Ionia Co.....	8
C. J. Deitrich, Grand Rapids.....	6
N. E. Smith, Ionia.....	17
C. E. Rust, Ionia.....	9
H. Cornell, Ionia.....	20
Joel Andrews, Saranac, Ionia Co.....	14

Having carefully looked over all the fruit on exhibition, we find, with one exception, all worthy of a first premium; but, having no premiums to offer.—which we very much regret, although it relieves your committee of a long and tedious task of comparing more minutely,—we cheerfully recommend the thanks of the society to each exhibitor, and especially to Grand Traverse Club and to N. E. Smith, Ionia. The committee regret that our chairman,

T. T. Lyon, refused to act with us, as it did not give us time to make such a report as we would have been pleased to see presented to the Society.

H. B. CHAPMAN, Reading.
D. T. FOX, Kalamazoo.

REPORT OF THE COMMITTEE ON GRAPES, PEARS, AND WINES.

Your committee respectfully report that they find on exhibition one plate of pears and one plate of quinces from the Peninsula Farmers' Club, of Traverse; also a plate of fine specimens of the delicious Delawares, from N. & C. Chilson, of Battle Creek; also three varieties of grapes,—Isabella, Delaware, Eumelan,—from N. E. Smith, Ionia. Mr. Smith also exhibited one can of Hale's Early peach of unusual size, measuring $7\frac{1}{2}$ and $7\frac{5}{8}$ inches in circumference when picked. Also five varieties of grapes from E. Le Valley, of Ionia,—Delaware, Concord, Catawba, Rogers' Wilder and Agawam. Mr. Le Valley also exhibited two varieties of water-melons in a good state of preservation.

Two varieties of sweet wines were also on exhibition, one variety by George Hosford, a pure Concord of the vintage of 1871, a good sweet wine; also one variety from Mr. Bradfield, of Ada, the Iona, of the vintage of 1872, a delicious sweet wine of much promise.

There is also twenty-four varieties of dried fruits of the Alden process exhibited by C. J. Dietrich, of Grand Rapids, that is deserving even more than a passing notice. Your committee would cheerfully recommend them for general use.

Your committee would also recommend the preservation of more of the finer varieties of fruits for our winter exhibitions. The gentlemen who have honored us by their exhibition of these varieties of fruits at meetings are worthy of a good deal of credit, and their example is worthy of imitation.

All of which is respectfully submitted.

WILLIAM ROWE,
R. F. JOHNSTONE,
H. W. CURTIS,
N. CHILSON.

After a very interesting and useful meeting the society adjourned to meet at Lansing in February, 1875.

THE FEBRUARY MEETING.

LANSING, February 9, 1875.

This meeting of the State Pomological Society was a very interesting and successful one. The papers read were of a high order, and the discussions were instructive. The display of fruit was very creditable, and was made in the old library room. The meetings were held in Representative Hall.

The fruit raisers, especially of peaches, are feeling very despondent over the prospects for the fruit crop of the coming summer and fall. They are agreed that the unprecedented cold weather of Monday and Tuesday has killed nearly all the peach buds, and some are confident that many of the trees have been destroyed. A few are hopeful that on the lake shore a partial crop may be raised. Most of those expressing an opinion say that other fruits than peaches have not been injured seriously. They say that the weather since the severe freeze of Monday night has been very favorable for the fruit crop.

The society convened on Tuesday afternoon at the old library rooms in the capitol. Mr. George Parmelee, president of the society, was absent on account of the severity of the storm, and on motion Mr. T. T. Lyon took the chair. The following programme was announced:

TUESDAY P. M., FEBRUARY 9.

What grapes to plant—E. Bradfield.

Discussion opened by G. W. Brown.

Thinning fruit—N. E. Smith.

Consideration of catalogue of Americal pomological society—by J. P. Thompson.

TUESDAY EVENING.

Inaugural address—George Parmelee.
 Economic entomology—Prof. A. J. Cook.
 Ornamentation of houses—C. W. Garfield.
 Michigan at the Centennial.

WEDNESDAY A. M., FEBRUARY 10.

Pruning peach trees—Hon. A. S. Dyckman.
 Discussion opened by D. R. Waters.
 Money in fruit—Hon. E. Buell.
 Manufacture and application of manures—Frank A. Gulley.

WEDNESDAY P. M.

New varieties—T. T. Lyon.
 Pruning apple trees—Prof. W. J. Beal.
 Neatness and order—James Satterlee.
 Discussion begun by H. D. Adams.

WEDNESDAY EVENING.

Address by President T. C. Abbot—Agricultural Education.
 Organization among farmers—R. E. Trowbridge.
 Destiny of Northern Michigan—W. L. Webber.

THURSDAY A. M., FEBRUARY 11.

Where to buy our trees—A. G. Gulley.
 Discussion commenced by C. W. Garfield.
 Marketing fruit—D. W. Wiley.
 Setting trees—N. Chilson.
 Resolutions—Miscellaneous discussions will occur at different times during the meeting.

Secretary Thompson stated that owing to the absence of some of the speakers, the programme would be changed; and he would first introduce the subject of the catalogue of the American pomological society. He stated that the fruits of Michigan were very imperfectly represented, and gave several instances of these imperfections in relation to apples and peaches.

T. T. Lyon, after calling J. M. Sterling to the chair, agreed with the secretary in his remarks, and would offer a resolution to the effect that a committee of three be appointed to complete and send a list of fruits to the secretary of the American pomological society for insertion in their catalogue. The following is the committee: T. T. Lyon, of South Haven; G. Parmelee, of Old Mission; H. Dale Adams, of Galesburg.

N. E. Smith of Ionia then gave a short talk on the thinning of fruits. He spoke first of thinning grapes, describing the method by which he was enabled to raise four tons to the acre, of superior quality. As to peaches, he would shorten in the branches and thus would gain two objects,—to control the amount of fruit, and produce new shoots. These shoots should be cut back one-half, and thus produce a central growth. As to thinning apples, he thought it would be too expensive.

Mr. Bidwell, of South Haven, preferred to do his thinning by means of pruning. He objected to growing peaches in the center of the tree, as they lacked in color. Mr. H. D. Adams spoke of Mr. Engle's peach orchard, in which was practiced both pruning and thinning; a very fine crop was the result. About fifty trees could be thinned in a day.

C. Monroe of South Haven thought that in this discussion pruning should be kept separate from thinning. He gave his experience in thinning peaches. He thinned 700 trees at a cost of \$35. The result was at least a double crop, and the peaches were of superior quality.

Mr. H. O. Hanford of Indiana advocated thinning and shortening in of the peach, and thought it would always pay. In answer to a question, Mr. Monroe said he cultivated his thinned fruit under, but would not recommend it.

Prof. Cook thought this thinning of fruit merited full discussion, as a means of destroying insects.

MISCELLANEOUS.

Mr. Thompson referred to the cold winter of 1872-73, which was expected to destroy all the fruit and many other crops. Yet the products of 1873 were among the most satisfactory ever turned out in Michigan, and the fruit and vegetable crops yielded nearly \$4,000,000. He predicted that the crops of 1875 would prove eminently satisfactory, and further demonstrate that even severely cold weather did not at all necessarily destroy or even damage the fruit and other crops.

Mr. Thompson stated the number of acres of land in this State now devoted to fruit raising to be 241,048 acres, valued at \$25,000,000.

Mr. Le Valley, of Ionia county, said that his county possessed about 200,000 acres of good orchard land, and was a fine fruit-producing section.

MERITS OF DIFFERENT APPLES.

Mr. E. Buell, of Kalamazoo, said he preferred the Red Canada to all other varieties of apple grown in Michigan. Mr. Hanford, of Indiana, favored the Northern Spy. Mr. Johnson, of Lansing, said he had a number of Northern Spys in his orchard, and he found them the most reliably-producing of the trees in his possession. Mr. Buell did not question the merits of the Northern Spy apple, but he could not raise the fruit, though they had as good soil in Kalamazoo county as anywhere else, in his opinion, for raising apples. Mr. Claffin, of Mason, thought there was no difficulty in handling the Northern Spy in his section. The trees are good wood, and he found that at four years old they were good bearers. He knew of many most successful Northern Spy orchards, and they always produced large and fine crops, realizing handsome prices.

The society was then entertained by reports of the value of fruit and fruit lands in the various parts of the State. Numerous letters were read on the same subject. The conclusion was reached that the value of the fruit lands of this State was about \$100 per acre.

TUESDAY EVENING SESSION.

The evening meeting was held in Representative Hall, J. Webster Childs in the chair. The exercises were opened by a piece of music given by the Philharmonic society of Lansing.

Prof. Cook was then introduced, and spoke on "Economic Entomology." But a few years ago the idea of the practicability of science was ridiculed: now the reverse is true. The benefit of science is now recognized in its truly Christian element of working for the good of mankind, and the laboring man no longer ignores its teachings. Among the first laborers in this field was Dr. Harris of Massachusetts, and his book on insects injurious to vegetation should

be in the hands of every fruit grower. Among those men in this department who have done much good are Dr. Fitch of New York, whose labors saved \$50,000 a year to his State, Dr. Wallace, Profs. Riley of Missouri and Le Baron of Illinois. The works of all these men are of great value, and should be in possession of all for consultation. The best book for scientific study is Packard's Guide. Besides the good these men have done, numerous societies and agricultural colleges are helping the cause.

The first great need of economic entomology is pure scientific investigation. So great has been this lack, that many of our most common insects are still undescribed. Investigations are very greatly needed, by which we may be enabled to stop the ravages of destroying insects. As a practical illustration of this, he would mention the means of destroying the peach curculio, as used by Mr. Ransom. Another need is the free use of the press to diffuse this knowledge among the farmers. The professor intimated that experiments would be conducted at the college this year which might lead to some practical results in the line of economic entomology.

The address was followed by music,—trio, "Advent of Spring."

Opportunity being given, Mr. Dyckman inquired as to the success of the codling moth experiments at the college. Prof. Cook thought they were successful, as only about one apple in three in the college orchard was injured, while in an adjoining orchard, where no bands were used, almost all the apples were injured.

A. G. Gulley of Dearborn was then introduced, and read a short paper on "Where to buy our trees." He would lay it down as a maxim that, no matter where we bought trees, it would pay to get the best, even if high-priced. There is no objection in buying eastern trees on account of distance, as they can be safely shipped to almost any distance. There are five States producing stock, of which New York takes the lead. In general, southern and western stock is not hardy, and is killed back by severe weather. In procuring stock, make your purchase in person, if possible; if not, order by mail of the dealer. Salesmen and agents can generally be trusted, but they should have certificates of late date. Agents who advocate new and improved varieties should be shunned. Eastern trees that have been heeled in during the winter should not be purchased. In conclusion, he would recommend Michigan stock before that of New York or the east.

C. W. Garfield spoke of his correspondence with a number of fruit growers on this subject, and the universal verdict was to use Michigan stock, as it was near at hand and easily examined. A great objection to eastern stock is that it is apt to be forced, and on transplanting it fails. He also said that the dark spot in the centre of a shoot was no sign of its being diseased.

Mr. Garfield, who was to speak on "how to beautify homes," limited his remarks to "floral decorations," illustrating the points of his address by means of colored diagrams and combinations of cut flowers. Floriculture is in one sense a primary department of pomology, as all fruits are preceded by flowers; and the highest attainment of horticulture as a fine art is in the cultivation of flowers. One great difficulty in arranging flowers for ornament, either in the garden or parlor, is that it is a matter of taste, and what one likes another dislikes. Still, there are a few laws of color and form, quite universal, upon which all may agree. There are three primary colors, red, yellow, and blue; if united in proper proportion, these constitute white. Combinations of these in couplets form secondaries, which are complementary to the first set. Red and yel-

low form orange, which complements blue; red and blue form violet, which complements yellow; likewise yellow and blue form green, which complements red. Colors mutually affect one another, from the established fact that the eye, if confined upon one, tires of it, and if turned away, sees the complement. Thus, after looking a moment at a rich green, if the eye be turned upon a white wall, a tint of red is plainly seen; and if red be placed by the green, it will be strengthened, and the effect is reciprocal.

The speaker here illustrated with cut flowers the principle involved, and said that upon it depended to a great extent the effect of floral combinations. Form has to do with floral decorations in a marked degree. Pleasing views, wavy outlines with easy transitions, or delicate spray with natural droop, are important elements of beauty, and the natural habit of a flower or plant should always be studied and indulged. The form of vase or bed has greatly to do with the effect of what is contained therein. Flowers should be suited to their surroundings. Bright rooms require a predominance of white flowers with airy foliage; while dark parlors, with rich deep-colored furniture, are better decorated with strong colors and heavy green foliage. Flowers arranged deftly in a vase, so that each specimen may be observed by itself, are appropriate anywhere.

The speaker alluded to table decorations and how to make them effective; then gave in detail plans for tasteful flower borders, advocating the massing of colors, or planting in ribbons, in such a manner as to cause forms and colors to mutually assist one another in making up a unit of display. In the arrangement of flower borders we should keep constantly before us the three elements of garden beauty, to wit: utility, interest, and unity. To this end we must consider the height and habit of the plants, their color and duration, their season of bloom. The speaker closed his very interesting remarks by speaking of the moral worth and beauty derived from the cultivation of flowers.

The meeting was closed by music,—a duet.

SECOND DAY—WEDNESDAY.

LANSING, February 10, 1875.

The weather having somewhat moderated, the attendance Wednesday morning was larger and the display of fruit more extensive than on Tuesday. The president and all the northern delegation, however, had not yet arrived, and their attendance, owing to the extreme depth of snow, is despaired of.

The meeting was called to order at 9:30 o'clock, in Representative Hall, by Hon. W. L. Webber, of East Saginaw. A. S. Dyckman presented an address on

PRUNING PEACH TREES.

The speaker took issue with Mr. Downing, the best authority on the matter, claiming that the process of "shortening-in" recommended by him induces too thick a head, which causes mildew, etc. We should follow nature more closely. He set the budded side of the tree toward the wind, *i. e.*, northwest. He selects three shoots three feet from the ground from which to form the head. These will form a good open head. He prunes in the winter, which with a lit-

the rubbing off of buds in summer, is sufficient. The main idea of pruning is "thinning." We put "thinning" in the place of Downing's "shortening-in." This thinning process makes a more natural development; it admits air and sunlight; gives a more abundant yield of fruit, and more greenbacks to the fruit grower.

D. R. Waters continued the discussion, opposing Mr. Dyckman. He did not disapprove of Downing's process of "shortening in." He referred to the ideas of Mr. Thomas, the celebrated pomologist, upon this subject, which accorded with those of Mr. Downing. He preferred a compact, stout head rather than long straggling branches. Late fall or early spring is the time for pruning. The "shortening-in" process prolongs the life of the tree. He preferred trees headed low, two feet from the ground, claiming that they were more healthy and more easily cared for. He would prune in early fall. Mr. Wiley, of Saugatuck, sided with Mr. Dyckman. Mr. Hanford, of Bristol, Indiana, believed in the "shortening-in" system, but followed it only every alternate year. Mr. T. T. Lyon thought that Mr. Dyckman's own orchard was in itself an argument against the thinning process, as he believed that there might be four times the amount of wood in the central part of his trees without shutting out the sunlight.

F. A. Gulley, of Dearborn, who has been a student at the Agricultural College, read a paper on the "manufacture and application of manures." Fifteen years ago manure could be had in Detroit for the hauling. It is now worth from 50 cents to \$1.50 per wagon-load. They (Gulley & Son) have been experimenting in manufacturing manures by breeding and rearing pigs and feeding cattle upon the farm, and were entirely successful. The speaker dwelt at length upon the comparative value of manures produced from different kinds of feed, and gave an account of an experiment by him in which \$50 expended in manure increased the value of an oat crop \$150.

Marsh muck united with manure is very valuable. With clear muck he has increased the raspberry crop one-fourth. They also manufacture manure by means of composting.

They apply manure at any season when there is not a crop on the ground, but do not apply it on sloping ground where it will be washed off, unless immediately worked under. The manure is drawn in dump-carts and spread standing on the ground. This is the most economical way. Best tools to use are light four and six-tined forks.

The address was warmly received. Mr. Hanford thought that this high process of composting would not pay the general farmer. He believed in clover and plaster. Dr. Miles, of the Agricultural College, said he approved heartily of the paper. He thought it the best elucidation of the matter he had ever heard. It was not only based upon practical experience, but was right in principle. The only point he would criticise is putting a tile drain under the yard. He would dispose of all moisture by evaporation.

An invitation to visit the Agricultural College was accepted for Monday afternoon.

Adjourned for dinner.

WEDNESDAY—AFTERNOON SESSION.

Among the prominent men in attendance are the following: Mr. H. E. Bidwell, South Haven; Mr. A. S. Dyckman, South Haven; Mr. T. T. Lyon, South Haven; Mr. C. J. Monroe, South Haven; Mr. D. R. Waters, Spring Lake; Mr. S. O. Knapp, Jackson; Mr. J. W. Childs, Ypsilanti; Mr. W. L. Webber, East Saginaw; President Abbot, Agricultural College; Prof. M. Miles, Agricultural College; Prof. A. J. Cook, Agricultural College; Prof. W. J. Beal, Agricultural College; Mr. F. A. Gulley, Dearborn; Mr. A. G. Gulley, Dearborn; Mr. H. Dale Adams, Galesburg; Mr. E. Buell, Kalamazoo; Mr. B. G. Buell, Little Prairie Ronde; Messrs. Wood, Ives, and Rowe, Mason; Mr. W. W. Baxter, Mr. H. B. Chapman, Mr. S. J. Watkins, Mr. N. P. Brockway, Hillsdale county; Dr. Owen, Messrs. Dean, Sigler, and Collar, Adrian; Mr. Charles Ilgenfritz, Monroe; Mr. J. M. Sterling, Monroe; Mr. A. O. Hyde, Marshall; Mr. N. Chilson, Battle Creek; Mr. James Satterlee, Greenville; Mr. J. Kerr, Eagle; Mr. A. C. Glidden, Paw Paw; Mr. H. P. Hanford, Bristol, Indiana; Mr. J. A. Davis, Marshall; Senator Mitchell, Grand Traverse; Mr. D. T. Fox, Kalamazoo; Mr. N. E. Smith, and Mr. Le Valley, of Ionia, and very many of the citizens of Lansing and adjoining towns.

Hon. J. Webster Childs was called to the chair. The committee on fruits was then announced: D. R. Waters, of Spring Lake; B. G. Buell, of Little Prairie Ronde; H. E. Bidwell, of South Haven.

The first paper read was by T. T. Lyon on "New Varieties." He gave the history of new and promising varieties of fruit.

Prof. W. J. Beal, of the Agricultural College, delivered a lecture on

PRUNING APPLE TREES.

The lecture was illustrated by charts. The following is a brief abstract:

There are advocates for all kinds of pruning, for high tops and for low tops, and for not pruning at all seasons of the year. It is important that the boys have a good example, for they generally follow the practice of their fathers or neighbors. It is better to prune too little than too much. Keep a central stem from which numerous branches are allowed to remain not less than eight inches apart from center to center. This will prevent bad notches, which are liable to split down. Thin out the small limbs at the outside of the tree, instead of the larger limbs near the trunk. Keep the top thin, then the lower limbs will not die on account of shade. Cut limbs off close, but none larger than an inch in diameter. It is better to cut off two or three or more small limbs to check a large branch than to remove the branch itself. Prune when the tree is not frozen or growing, except pruning or rubbing off new growth. To change the height and shape of a tree begin when the tree is young and make the change gradually. Too many prune in a bad manner, worse than none at all. The majority of Michigan orchards are poorly and improperly pruned.

Mr. James Satterlee, of Greenville, a graduate of the Agricultural College, read a valuable paper upon

NEATNESS AND ORDER.

He referred to the fact that neatness and order are more characteristic of the banker's and merchant's business than of the farmer's, and urged the importance of his theme. He thought education and social refinement the

precursors of order and neatness, and paid a high encomium to the Agricultural College and the work it is doing. He referred to the employment and comfort accruing from the keeping of a neat and beautiful lawn, and gave many apt hints concerning landscape gardening.

Mr. H. Dale Adams continued the discussion at some length.

A communication from the Monroe County Agricultural Society, inviting the society to hold the June meeting at that place, was referred to the Executive Committee. The invitation was accepted.

Considerable discussion was had on the appearance of the blight in the apple tree. Reports from various parts of the State show that the disease is progressing. Considerable fear was expressed that it might be as serious as the dreaded pear blight. No explanation could be given of the cause of the disease. It attacks both old and young trees, slow and fast growers.

Adjourned.

WEDNESDAY—EVENING SESSION.

Notwithstanding the severity of the weather the hall was well filled by a highly intelligent audience, and the exercises were of an exceedingly brilliant character.

After music, President Abbot, of the agricultural college, delivered an eloquent address upon the necessity of agricultural education. He portrayed the need of education among farmers, and urged the claims of the agricultural college upon the farming community, which he says has been conducted at a less expense than any other similar institution in the country.

Hon. Rowland E. Trowbridge of Lansing read an interesting and valuable paper on organization among farmers.

Hon. Wm. L. Webber of East Saginaw then read a most interesting description and historical paper on "The Destiny of Northern Michigan," when at a late hour, the meeting adjourned.

THIRD DAY—THURSDAY.

The first exercise was the report of the committee on apples. They report sixty-five varieties on exhibition, and many duplicates. Among the principal exhibitors were:

The Ingham county farmers' club, 31 varieties.

South Haven society, 18 varieties of apples, and specimens of cherries and other dried fruits.

H. Dale Adams, Galesburg, 26 varieties; A. L. Sturgis, Okemos, 10; H. S. Merrell, Lansing, 20; J. Satterlee, Greenville, 9; J. Lee, Leelanaw county, 10.

D. B. Johnson of Lansing, H. P. Cherry of Johnston, Dr. Owen of Adrian, and E. Buell of Kalamazoo, were prominent exhibitors.

Grapes, well preserved, by George W. Brown, Lansing.

The quantity of fruit on display was not very large, owing to the severe cold weather, which prevented many from bringing specimens. No exhibitors were present from Grand Rapids or the Grand Traverse region, the fruits from these

points being detained by the storm. A large quantity of the apples of the Ingham county farmers' club were badly frozen.

Secretary Thompson made some remarks on the proposed new census bill; and on motion of Mr. Dyckman, the sense of the meeting was ascertained by yeas and nays, and supported the taking of an annual census.

The secretary read letters from various parts of the State in relation to the cold weather, and the prospects of a fruit crop for the coming year were regarded as poor.

A memorial was read and adopted, asking the Legislature for an appropriation to aid the society to make an exhibition of fruit at the meeting of the American Pomological Society at Chicago, in September.

Mr. R. F. Kedzie, meteorologist of the society, presented a paper on meteorology, and introduced a resolution (which was adopted) memorializing the Legislature of this State to pass a joint resolution requesting our senators and representatives in congress to have the signal service so extended as to benefit the agriculturists of this State.

The resolutions of the South Haven pomological society, objecting to the incorporation of the pomological with the agricultural report into one book, was then taken from the table, and referred to the executive committee.

On motion the following committee on the "bird question" was appointed: A. J. Cook, F. A. Gulley of Dearborn, James Morris of Palo.

G. W. Brown of Lansing gave in detail his method of raising grapes, and would recommend as the best the following: Salem, Eumelan, Rogers' No. 4, 15, 19, 53.

Mr. Bidwell of South Haven read a bill and a memorial to the Legislature, requesting the passage of said bill, which refers to the disease of the peach known as the "yellows." By a vote of the society it was deemed advisable that said bill should be passed.

Mr. R. F. Johnstone, chairman of the committee on resolutions, reported a series, thanking the Legislature, the citizens of Lansing, the Philharmonic society, the officers of the Agricultural College, the representatives of the press, and everybody in general who have aided in the success of the meeting.

The society adjourned at 1 P. M., after a very useful and entertaining session.

THE JUNE MEETING AT MONROE.

The summer meeting of the State Pomological Society at Monroe was not only one of the most complete and thoroughly instructive, as well as one of the most agreeable and pleasant conventions of this distinguished organization, but it was a success in every way. Its display of fruits and flowers was very fine; the lectures, addresses, papers and discussions were each full of interest to the very large audiences which filled the hall; and the attention to the visitors by the citizens of Monroe was a sample of the public spirit that fills the hearts of the people of that city.

The meeting was held at the invitation of the Monroe County Agricultural Society, whose principal officers are J. M. Sterling, President; W. A. Noble, Treasurer, and H. A. Conant, Secretary.

The convention organized at the City Hall, Tuesday, June 29, 1875, which the Mayor and Common Council had put at its service. It was very beautifully filled up, and the floral decorations were arranged to make the hall very attractive without diminishing the accommodations for seeing and hearing.

Amongst the visitors present were Governor Bagley, Addison Kelley, the well known grape grower and wine manufacturer of Kelley's Island, M. B. Bateham, the Secretary of the Ohio State Pomological Society, Col. D. C. Richmond, Leo. Weitz and G. F. Newton, representing the Executive Committee of the Ohio State Horticultural Society. The attendance of members from South Haven, Grand Rapids and other portions of the State was larger than usual. On the first days of these conventions George Parmelee, Esq., of Old Mission, Grand Traverse, with the whole of the Executive Committee and other officers, were present, excepting Mr. Seymour, the Treasurer, whose place was filled by Mr. H. Dale Adams, of Kalamazoo county.

After the convention was called to order by the President, the Secretary directed attention in a brief address to what the society had before it for the present year, showing the importance of Michigan fruits and the interest connected therewith being fully represented at the biennial meeting of the American Pomological Society, which is to be held in September next at Chicago, and also that preparations must be made this year for a full exhibition at the Centennial Exposition of next year. In connection with the convention at Chicago a letter was read from O. B. Galusha, of Normal, Illinois, giving the details of the programme instituted by the Illinois Horticultural Society for the forthcoming exhibition and convention. The circular says:

"The society will hold its meetings for discussions in the Methodist Episcopal Church, southeast corner of Washington and Clark streets. These will be attended, as heretofore, by leading horticulturists from all parts of the country. Under the auspices of the Illinois State Horticultural Society there will also be held in the Inter-State Industrial Exposition building, a national exhibition of fruits and other horticultural products of North America. Seven thousand square feet of space in the south end of the main floor and gallery of the great Exposition building will be assigned to the various States, territories and provinces; and in the space assigned to each State, territory or province will be arranged the State, county, society or individual collections contributed therefrom. It will be our effort to have every section of the country from Nova Scotia to California, and from Key West to Oregon, suitably represented in a truly continental exhibition of fruits, and to this end we solicit your personal effort and influence to secure a complete representation of your fruit products. Upon the same day, and in the same building, the great Inter-State Exposition of the Arts and Industries will begin its four weeks' exhibition. Free tickets, admitting them to all parts of the convention, will be issued to all members of the American Pomological Society and to contributors of fruits for the exhibition. Railroads will make reduced rates."

It has been decided that the Governor of the State shall appoint a committee of three to take charge of the fruits for this exhibition, and that a committee of thirteen be selected from the several fruit growing districts of Michigan to collect fruits to be shown.

In regard to the Centennial, it was stated that \$7,500 having been placed at the disposal of the Governor to aid in promoting a representation of the products of Michigan at the exhibition, a commission will shortly be appointed consisting of four members, and circulars will be issued stating the general regulations which will govern them in their work, and also furnishing full information to exhibitors.

The reports of the several district and county pomological and horticultural societies were read. Judge J. G. Ramsdell, from Grand Traverse, reported that the apple orchards on the side hills and rolling lands in that region were but

little injured, and will have a fair crop. On the lower lands, highly cultivated orchards were severely injured, and will have no fruit. Peach trees, except in a few favored localities, were so badly damaged as to be rendered worthless. His peach orchard, on a northwestern exposure, will bear a good crop in places, some trees being killed. Sweet cherries were uninjured and are heavily loaded with fruit; American mulberries the same. His plum orchard of 750 trees was not injured, and is well loaded with fruit. Mr. Ramsdell's orchards are all on the side hill. Pear trees—an orchard of sixty trees—are uninjured and will yield well. Apricots are uninjured; nectarines are badly damaged. There will be no nectarines above the snow line. His two acres of grape vines are uninjured, and are well loaded with fruit. Small fruits in the Grand Traverse region are generally uninjured.

Mr. Adair thought there would be a fair crop of apples from the orchards in the vicinity of Detroit, but that other large tracts were generally killed.

Prof. W. J. Beal, of the Agricultural College, reported that the fruit trees in Ingham county were making a good growth this year, but he had never seen so few fruit blossoms. The extreme cold of the last winter at Lansing was thirty-three degrees below zero. The Northern Spy was badly split by the frost. Tile draining is very essential to the protection of orchards from the effects of the frost.

J. Suttle, of Grand Rapids, said a number of peach orchards in Kent county are badly damaged by the frost, but would probably live. The apple crop is a failure. Small fruits are a fair crop generally. Grape vines are occasionally damaged by the late frost, the leaves being literally scorched off.

Mr. Spaulding of Monroe said he had five and a half acres of grapes, mostly Concord, not a vine of which has been injured. Off four acres he had gathered last year 24,800 pounds, and thought he should do even better this year.

The secretary remarked that the fruit growers of the Grand River Valley were now engaged in holding *post mortem* examinations over their orchards. They had begun to discover that crops of fruit could not be grown without the soil was fitted by cultivation, by manures, and by draining. They had also learned that large crops of fruit were fully as exhaustive on these soils as heavy crops of grain year after year.

Mr. Waters, of Spring Lake, reported for that district that there would be no peaches above the snow line in his part of the State, and that fruit trees of all kinds were badly injured. Grapes will be about two-thirds of a crop. Of small fruits there will be a full crop. Amongst the apples the Baldwins and Greenings seem to have suffered most.

Mr. Sterling reported that the crop of apples in Monroe would be a medium crop, probably in many places a fair average.

Tuesday evening the hall was filled to overflowing, the ladies and gentlemen of Monroe turning out in full number. Mrs. C. Baldwin, teacher of music at the young ladies' seminary, and other ladies, contributed some rich vocal and instrumental music. The exercises of the convention commenced by a very happy address from the Hon. H. J. Redfield, the mayor.

MAYOR REDFIELD'S ADDRESS.

LADIES AND GENTLEMEN:—The city authorities, in honor of your presence, have ordered a particularly close cleaning and brushing up of streets and by-ways, and the elements,—seemingly in unison with our desire to present a tidy appearance,—have combined to offer us a day of uncommon loveliness. The full glory of ripe and robust summer, all redolent with comfort and enjoyment, all fragrant with flowery perfumes and rich with fruity odors, is in our full possession. The merry waters of our traditional river flash and glitter in the

morning light, and seem indeed to laugh and sing as they ripple and glide over their clean bed of pebble and rock to tell the listening lake of your arrival. "Sweet fields beside this swelling flood stand dressed in living green" to greet you. Wide streets, begirt with stately maples; broad avenues, sentinelled with grand old elms, reach out their grateful shade to cover you. Overtopping maple and elm, and statelier than either, the old pear trees erect their venerable heads and seem to nod their morning salutation, as they wait for their centennial jubilee. It is well and wisely given to the accomplished Willets to speak for them,—to relate how far back in the last century they were transported from the soil of merrie France and transplanted on this then wild river-side,—and how the same hands that drew the virgin soil around their roots at the same time uplifted the advancing herald of civilization and Christianity, the holy cross; how the towering walnuts grew thick and close to the water's edge on either side, and how, from root to topmost branch, and stretching from tree to tree across on either bank, there interlaced in rank luxuriance and hung down in great festoons and bunches, and flourished and fruited in their season, the product of that "immortal vine" which maketh the "heart of man glad," and which gave to the river the name it yet bears. Beneath these umbrageous shades the red man "paddled his light canoe" and wooed and won his dusky maid, and both alike, in the abandon of their wild nature and the wild scene, reached forth their swarthy hands and plucked the dusky, musky fruit and stained and dyed their dark skins and crimson lips with the purple blood of the clustering grapes o'erhead.

Canoe, walnut, wild vine, wild man and maid are gone; but he who finds himself on the river's brink in the twilight hour to-day, will see that Jack and Gill, and Sue and Bill, keep up that old, old sparking still!

To-day, for miles along this river, on the islands in the bay, and away to Pointe aux Peaux, on the lake, the eye is greeted and the senses charmed with the sight of oft recurring vineyards, rich in variety, perfect in cultivation, and marvellously abundant in production. Verily has the valley of the River Raisin become the American Rhine; and when the rich laden baskets are seen, and the merry voice of the grape-gatherer heard in our midst, this, indeed, seems to be an enchanted land,—the Switzerland of the New World.

If Sterling will uncork upon the subject of the growth and management of the vineyard, the acreage and yield of the fruit, the manufacture and handling of the wine, with one-half the dexterity he unbottles the article itself,—and he can do both,—you will be full to overflowing of "a feast of reason and a flow of soul."

But neither pears nor grapes, however luscious, monopolize the land. Great nurseries of the apple, cherry, peach, and plum are seen on every hand, and large orchards intervening on every side, some hoary with years and of immense size, and yet vigorous, still drop their ripe fruit into the lap of the fourth generation, who have sat under their branches and partaken of their bounty. I venture upon the assertion that there is more money capital to-day invested on this shore in fruit and the products of fruit, than there is on the west shore, and that the life of the vine and tree and shrub with us,—owing to the vigor and heartiness of our soil,—is far more permanent and enduring, while the climate, aspect, and all the modifying influences of surrounding water, is not inferior here to any point in this parallel of latitude, or any where in the region of the Great Lakes. To these varied enjoyments you are bidden, and to a welcome as warm and cheery as it is given the heart of man to tender. We greet you with a hospitality as wide and open-handed as the best of good will can render it.

The Agricultural Society and its manly officers are here to repeat it. The ever generous and warm-hearted people of Monroe will labor to make your stay with us pleasant and profitable, and the constituted authorities of the city are happy in the honor of your presence. Monroe, second in years of the Michigan cities, receives you in her borders and offers "the freedom of the place." And the oldest mayor in existence,—having reached the wooden wedding of executive life,—invokes upon your coming and parting all pleasure and enjoyment.

The mayor concluded by introducing Governor Bagley, who made some pleasant remarks about his attempts to make himself an agriculturist and pomologist during the past year. He spoke very frankly of the importance of fruit culture as one of the resources of the State which should be promoted as a leading interest, and amongst those engaged in it were to be found our best citizens.

The President of the convention responded to these addresses, and then Dr. Edward Dorsch of Monroe submitted a paper entitled "Our friends, the Mole, the Toad, the Spider, and the Owl," which was read by Prof. Boyd.

On Wednesday morning a visit was made by a large party of fruit growers

who had accepted the invitation of Mr. George Bruckner to the vineyards and orchards on Lotus Island, a fine rolling land southeast of the city, and elevated amid and above the marshes of the River Raisin.

In the convention the morning was principally spent in arranging the work. T. T. Lyon, of South Haven, from the Committee on the Chicago Exhibition, reported the arrangements made to secure an exhibition from the State, and the appointment of a committee of thirteen to collect the fruits for it.

The following committees were announced:

On Flowers—E. J. Guild, of East Saginaw; Mrs. H. Dale Adams, of Galesburg; Miss Cora Reynolds, of Monroe; Mrs. Elizabeth M. Chapman, of Reading; G. F. Newton, of Millersburg, Ohio; John Tuttle, of Grand Rapids.

On Wines and Vinegar—R. F. Johnstone, of Detroit; H. Benjamin Dansard, of Monroe; A. Kelly, of Kelly's Island.

On Apples, Cherries, and Strawberries—Col. D. C. Richmond, of Sandusky; Hon. Wm. Adair, of Detroit; Hon. S. O. Knapp, of Jackson; James W. Helm, of Adrian; N. Chilson, of Battle Creek.

Mr. Lyon tendered his resignation as chairman of the committee from Michigan, to correct the American Pomological Catalogues, stating that the National Society having appointed Mr. I. S. Linderman, he thought it better that the State Society should yield, and thus promote harmony, and hence he hoped his resignation would be accepted. His resignation was not accepted, but the committee was requested to proceed and prepare a catalogue of fruits for Michigan and report the same.

Prof. Beal delivered an illustrated lecture on fungoid production, which was listened to with marked interest. He took the ground that fungoid growth is not an indication of disease, but that these growths are liable to appear upon either animal or vegetable life, when there is no disease, and that its appearance is not an indication of disease. Secretary Thompson called attention to this as being contrary to the previous conviction of some who had given the subject study, and called out president Parmelee, who said he had studied fungus in nature's laboratory for many years, though not scientifically, and was convinced that the appearance of fungus was a sure indication of disease, and that when there was no disease no fungus would appear. Prof. Beal said he did not give his conclusions as the result of his own investigations, but as the result of the investigations of scientific men who have given the subject careful study for years.

Prof. Cook, of the State Agricultural College, in the afternoon delivered a lecture on the Phylloxera, the parasite that has done so much damage to the vineyards of France, and which is claimed to have been introduced from this country. The Professor explained that there was the leaf Phylloxera and the root Phylloxera, and exhibited roots and leaves infested by each, but that the insect was the same, only in different stages of its development.

Mr. Kelley and Mr. Bateham made some remarks showing that the mildew and rot of the vineyards had been prevalent for many years, and Mr. Bateham was inclined to think the damage was more owing to the frosts than the Phylloxera, but Mr. Kelly thought that the diseases and destruction caused by the Phylloxera, and the ravages it had caused in France, as well as its manifestations in this country, were too marked to be imputed to aught else but this parasitic insect.

The convention then adjourned for the purpose of permitting the members to visit the extensive nurseries of I. E. Ilgenfritz & Co. and Reynolds, Lewis & Co., and also to allow the several committees to make their examinations.

WEDNESDAY EVENING.

The hall was crowded with a brilliant assemblage of ladies and gentlemen. The Rev. Dr. Mattoon, of Monroe, made a short, eloquent and humorous address, "Pomology in the Line of Civilization," after which president Parmelee read a paper on the connection of Pomology with Meteorology. This paper was one showing great observation and a power of deduction.

The Hon. Edward Willets gave a very interesting history of the old pear trees of Monroe, showing that they were descendants of the old French pear trees originally grown on the banks of the Detroit river, and they were taken to Monroe by the grandson of an old French soldier and Colonel, named Francois Navarre in 1805. The sketch given by Mr. Willets was listened to with intense pleasure.

The session closed with very fine music.

THURSDAY MORNING.

John Suttle, of Grand Rapids, proposed an amendment to the constitution of the society, "That hereafter the annual elections should be held at the time of the annual State fair." The proposition lies over to the next meeting under the rules.

THE ENGLISH SPARROW.

After the assembling of the convention, Secretary Thompson introduced the subject of English sparrows, saying he had been visiting in Springfield, Massachusetts, where the sparrow had driven away the doves, and it was said they would drive away other birds. He called on Mayor Redfield for his observations. Mr. Redfield had observed the sparrow and its habits considerably, and had never seen them disturb other birds. They were effective in destroying insects, but he had never seen them attack fruit.

Mr. Leo. Weltz, of Ohio, had known the sparrow from a boy, and gave his testimony that he was a great destroyer of cherries and of grains.

Mr. Bateham, of Ohio, also testified against the sparrow, as a destroyer of berries, cherries, and grain.

Mr. G. F. Newton, of Ohio, and also Messrs. Weier and Doyle, of Monroe, spoke in favor of the sparrows, and believed they would not attack either fruit or grain until they had cleaned out the insects, and thought there was room enough for them and the other birds.

It was stated that Mr. Geo. S. Cowan is the man that first introduced the sparrows to Monroe. He was the first to talk about it, and made the order for the first sparrows that ever came to Monroe; and E. S. Sill paid \$5 50 and J. M. Sterling paid the same amount for said sparrows. Mr. Sterling said he was induced to send for the sparrows by action of the Society. He was a little surprised to see the Society "go back" on the sparrow. There are several thousand of them in Monroe, and the general testimony of the citizens of that place seemed to be in favor of the noisy, chattering, pugnacious, restless sparrows.

Those who spoke against the sparrows seemed to gather their ideas from what

they had read and learned while in the native land of the sparrows. It would seem that here there is so much more insect life to feed upon that the sparrows have no taste for vegetable or fruit food while they can gather so easily what they like better, and feed and fatten on animal food of the richest and most inviting kind.

STORING AND KEEPING WINTER APPLES.

M. B. Batcham, of Painesville, Lake county, Ohio, gave a description of the Cope or Quaker fruit houses of Columbia county, Ohio. He visited these houses in March, 1875. The weather was then mild, but the winter had been very severe and changeable, and the fall previous was quite warm and dry; hence apples were generally too ripe at gathering time for keeping in the best manner. At Nathan Cope's residence are three of the fruit-houses, each of the capacity of about five thousand bushels, and each nearly full of apples of various kinds, all in fine condition. The buildings are of plain and cheap construction, the sides of rough boards without paint, resting on stone foundations, banked up with earth. The size is about twenty-five by fifty feet, one story and a half high. The walls are double, with about a foot of dry porous material (tan-bark or sawdust) or confined air between, and the ceiling over the fruit-room the same, so as to have it frost-proof and as nearly air-tight as possible. The body of the house is one large room, having double doors at each end, and a passage-way for a wagon through the middle, with bins for holding the fruit on each side, composed of movable slats, held in place by upright posts. The floor under these bins is made of narrow strips of board, having air spaces between, through which ventilation is had from about a foot of space beneath the floor, and into this space fresh air is admitted by means of several large tubes passing through the foundation wall on each side, which can be opened or closed as desired, according to the state of the weather and the fruit. Then overhead in the fruit-room are two or three circular openings like stove-pipe holes, with tubes passing out through the roof, for carrying off the moist air, while the cold and dry air is coming in from beneath.

The plan of operation is, when the fruit is put in, to admit air freely during frosty nights and other cold spells, excluding it in warm weather, and during winter admitting cold air at all times,—only avoiding freezing of the fruit, which will not take place quickly, or until the mercury inside is several degrees below the freezing point,—then to hold the fruit *as near as possible at the freezing point until spring*; and this can be done with very little attention when one has learned the art, provided the house is well constructed. I was told that during the three winter months the temperature had not varied more than two degrees from the freezing point; and the perfect condition of the apples certainly corroborated this statement.

The residence of Joseph Cope is five miles from New Waterford, and near East Fairfield. His fruit-house is of the same general form and proportions, but of better workmanship, and his mode of ventilation is more perfect. The wall and ceiling being frost-proof and air-tight, the floor is also tight, excepting openings under the middle of each bin of fruit, and beneath these openings are ventilating troughs passing the whole length of the house under the floor, and opening out through the end walls, for the admission of air.

Inside of each of these troughs is a rod, which is attached to sliding valves, so arranged that by pushing or pulling the rod from the outside of the building the air is admitted or excluded from the fruit-bins at will. There are also

ventilating tubes in the ceiling over the fruit-room; and in addition to all this, as the peculiar feature of this plan, there are in the chamber above a couple of small sheet-iron heaters, or conical stoves, which are attached to the ventilating tubes, so that when a little fire is made in the stove the draft thereof causes the air to pass rapidly up the tube, thereby causing a partial vacuum in the room below, and this causes a rapid ingress of cold and dry air from the outside whenever it is desired to change the atmosphere of the room. I was shown the working of this mode of ventilation, and it seemed very perfect. By the aid of these heaters, the air of the fruit-room and its temperature can be changed very quickly, whenever it is seen that the fruit is getting too warm or too damp; and the outside air is cool, as on a frosty morning in autumn or spring; and when the air is renewed in this way, and the doors are not opened in the meantime, the room will keep cool for a week or longer, even when the weather is warm.

There were about four thousand bushels of apples in this house, consisting of about a dozen varieties, and put in without any sorting or care, as hauled from the orchards of the neighborhood. Such varieties as Fall Pippins, Rambo, and Belmont (Gate) were just in prime eating condition at the time of my visit, about as these commonly are found in December; and such as the Greening and Spitzenburg were not ripe enough for finest eating condition; and the late keeping sorts, like Russets and Willow, were as hard as when fresh from the tree. Being kept all the winter so nearly at freezing point, the process of ripening or decay does not go on, and consequently there is also none of that loss of juiciness and flavor which is common in apples kept in ordinary cellars, where the temperature is variable.

When the fruit from these houses is sent to market, in May or June, it has all the juiciness and flavor of freshly gathered apples, and will keep good for a much longer time than any ordinary fruit at that season; consequently it sells readily at high prices where known. Most of the fruit from the Cope houses has been sold in the Pittsburg market; but some has gone to Columbus, Cincinnati, and Louisville. As only a moderate sum is asked for the right, with instruction for building these houses, it is probable there will be quite a number of them erected within a few years.

MISCELLANEOUS SUBJECTS.

Prof. Cook, of the Agricultural College, made a short talk about currant worms, rose slugs, cut-worms, peach-borers, &c. The currant worm, also called the gooseberry slug, is easily killed by white hellebore, applied in solution, with a sprinkler,—two ounces of hellebore to five gallons of water. It will rinse off with the first rain, and do no harm; or the fruit might be washed before using. An application should be made when they first appear, and again in about two weeks. The rose slug may be killed by two-thirds of a teaspoonful of Paris green in a pail full of water, sprinkled on the leaves. The cut-worm, which attacks grape buds, can only be destroyed by digging them out and killing them. For peach trees, put a little band of cloth around the tree, and the worm cannot pass it. The borers lay their eggs at the foot of the tree, in the earth, about four inches below the surface. Removing the earth around the tree to this depth, and scraping the root of the tree, is a good thing.

Mr. T. T. Lyon said it was important to remember that the currant worm deposits its eggs on the under side of the leaves nearest the ground. The

presence of the larvæ is soon made manifest by the little holes made through the leaves near the central spine, and noticeable from above. A little examination of the bushes at this critical period, and the removal and destruction of the perforated leaves will save the crop.

Mr. Bateham gave his plan of washing fruit trees to kill the borer, and to keep the tree healthy, as follows: Take two ounces of carbolic acid and a quart of soft soap; bring to nearly a boiling point in five gallons of soft water. Apply to the bark of the trees. Besides killing slugs, it will discourage sheep and rabbits from gnawing the trees.

Hon. W. W. Murphy, of Jonesville, the distinguished consul at Frankfort-on-the-Main during the war, and who has just returned from Europe, being present in the room, was called on for a few remarks, and addressed the convention. He thought the grapes of France and Germany were not to be surpassed, though fruit generally was not so good as in this country. At a fruit show at Mayence, however, he had seen pears priced as high as from twenty to thirty francs apiece. Grape culture and wine-making is carried to a very high degree of art in Germany and France, and some of the choice wines bring fabulous prices at the wine sales. As high as 2,200 florins were paid for a twenty-two gallon cask of Johannisberg wine that had been in the cellar four years, and it would not be fit to drink until it was two years older. The most expensive wine is made from grapes which hang on the vines till about Christmas, and look like raisins when they are gathered. They have wine-tasters who are so expert in the business that they can tell by smelling a glass of wine (without tasting it) from what vineyard it comes, and how old it is. He spoke strongly in favor of the introduction of the sparrow, and declared it to be his opinion that he would be found to be a useful American bird.

Mr. C. S. Green, of Farmington, a member of the executive committee of the Agricultural Society, was called upon, and made a stirring, enthusiastic speech. He was not a member of the Pomological Society, he said, but he praised the work it was doing, hoped its members would push on, and wanted it and the State Agricultural Society to work in harmony. His remarks were received with frequent applause.

The paper of T. T. Lyon, of South Haven, on small fruits, was announced, and ordered published in the Michigan Farmer.

REPORT OF THE COMMITTEE ON THE CHICAGO MEETING.

The undersigned, a committee appointed by this Society to devise a plan for the collecting and display of Michigan fruits at the exhibition of the American Pomological Society, to occur at Chicago on the eighth, ninth, and tenth days of September next, respectfully submit the following report:

The Legislature of the State having, at its recent session, placed an appropriation in the hands of Governor Bagley for the purpose of providing for an adequate and creditable exhibition of this character at that time, your committee thought it but courteous and proper to consult him on the subject before determining the features of their report. They therefore availed themselves of the opportunity of his attendance at this meeting to confer with him on the subject, and are happy to be able to state that he seems to accord fully with the Society in his views respecting the importance of fully availing ourselves of the opportunity to display the capacity of our State in this respect; and that, after a careful consideration of the subject, he has determined to appoint a committee of *collectors*, so distributed over the State as best to represent the regions from which contributions of fruit may be expected; whose duty it shall be to awake an interest in this matter and, at the proper time, to collect and secure the transmission to Chicago of such specimen fruits and flowers as their localities shall be able to supply.

The Governor has also determined to appoint a committee of three experts, whose duty it shall be to present at Chicago, at the proper times, and to receive, attach the proper names, and display the fruits, selecting such as shall be most desirable for the purpose,—this latter committee to be also charged with the duty of conducting the necessary correspondence for the more perfect working out of the object had in view.

T. T. LYON,
J. M. STERLING,
S. O. KNAPP,
Committee.

REPORT OF COMMITTEE ON FLOWERS.

To the President and Members of the State Pomological Society :

Your Committee on Flowers would say that they have examined the numerous vases of cut flowers and plants, and are very happy to make the following report :

We find a very large collection of house plants exhibited by Mrs. I. E. Ilgenfritz and Mrs. Daniel Ilgenfritz, which are very fine, and especially worthy of a more extended notice than we have time or space to permit ; also 1 amaryllis, from Mrs. A. E. Aldrich ; 1 cactus, by Mrs. L. M. Dissenbaugh, which is very beautiful ; 2 tubs of ivy, forming a very beautiful arch, from J. Weiss ; several hanging baskets, by Mrs. I. E. Ilgenfritz and Mrs. J. M. Loose, which are especially fine. Among the cut flowers, bouquets and pyramids on the table, the display is very beautiful, to say the least, and very creditable to the ladies of Monroe and vicinity.

Your committee do not feel at liberty to discriminate by mentioning any one or particular entry, as they are all very fine, and are entered by the following persons :

Mrs. G. and L. Manning, Monroe, 1 pyramid of flowers.
Mrs. C. Walldorf, Monroe, 6 hand bouquets of flowers.
Mrs. G. Willets, Monroe, 3 hand and 1 saucer bouquets of flowers.
Miss Belle Wing, Monroe, 1 hand bouquet of flowers.
Miss A. E. Kendall, Monroe, 1 saucer of verbenas and tradescantia.
Mrs. Whelpley, Monroe, 1 bouquet of roses.
J. M. Randall, Adrian, 2 bouquets of flowers.
Mrs. Rose, Adrian, 1 bouquet of peonies.
Mrs. H. D. Haskell, Monroe, 5 hand bouquets and 1 saucer each of verbenas and pansies, which are very nice ; 1 stand of roses, etc.
Mrs. Newton, Monroe, 1 large bouquet of flowers.
Mrs. I. E. Ilgenfritz, Monroe, 3 hand and 1 saucer bouquets of flowers.

The committee do not feel warranted in closing this report without tendering their sincere thanks to the lady exhibitors for their exertions in helping to make the meeting a success, and hoping that their success during life may be made up of such successes as the present meeting has been.

E. F. GUILD, East Saginaw,
MRS. H. DALE ADAMS, Galesburg,
MISS CORA REYNOLDS, Monroe,
MRS. H. B. CHAPMAN, Reading,
JOHN SUTTLE, Grand Rapids,
G. F. NEWTON, Millersburg, O.,
Committee.

REPORT OF THE COMMITTEE ON WINES.*

The committee to which was committed the examination of the several wines exhibited at the Monroe meeting of the State Pomological Society, respectfully report that there were four samples presented by the Pointe aux Peaux Wine Company, as follows : Concord of 1871, Norton's Virginia of 1871, Catawba of 1871, and Delaware of 1870. These names represent the grapes from which the wines were made, and the year in which the wine was made from them.

* NOTE.—It was conceded by the wine committee at Monroe that the wine made from the Norton's Virginia grape was the best on exhibition. It is also known as "Norton's Seedling," and Downing says that it is "a variety introduced by Dr. D. N. Norton, of Richmond, Va. It is a most productive grape in garden or vineyard, bearing very large crops (especially at the South, where many kinds rot) in all seasons. It is valued for making a red wine. Bunch medium, shouldered, somewhat compact ; berries small, round ; skin thin, dark purple ; flesh tender, with a brisk, rather rough flavor ; ripens with Catawba." This statement of Mr. Downing's in regard to the productiveness of this grape does not agree with the experience of the grape growers of Monroe. Mr. Sedlaczek, a grape grower of Monroe, says that it there grows with great reluctance, and to make a good wine requires a gravelly soil and not one well adapted to the Concord or Delaware. Could it be produced in large quantities, the same as the Concord and Delaware, there is no doubt that wine making would become very profitable, for this wine of the Norton's Virginia at Monroe has but few superiors in the country.

The Monroe Wine Company presented three samples, namely: Red Concord of 1873, White Concord of 1873, and the Golden Concord, a champagne or sparkling wine.

John Reisig presented a bottle of Norton's Virginia, a very fine wine of moderate body, a pleasant astringent taste, a good flavor, and ranking with the very best shown; and although it lacked age, it was considered as equal to many of the fine Bordeaux wines of France.

Of the Pointe aux Peaux wines, the committee pronounced the Concord of 1871 as the best and most perfect. This was a white wine of a fine golden color, a delicious bouquet, a fair strength, and a flavor that showed it had much of the full spirit of the very soul of the grape. The Delaware of 1870 is a very delicate wine with much less bouquet and flavor, but is ripened by age, and so light to the taste that its fine body and strength is hardly appreciated or felt. As a wine for the sick it is probably unsurpassed. The Norton's Virginia was a red wine with a rough astringency and flavor, as if made of grapes that had not fully ripened. There was also a slight mustiness in the sample presented.

The Catawba was a fair wine, not very distinctive in character, with but little bouquet, but yet a fair medium wine.

The White Concord of 1873, shown by the Monroe Wine Company, was of a rich color, of a good bouquet, and a pleasant flavor and strength, but evidently not yet free from the effects of its manufacture.

The Red Concord differed in color, and has rather more astringency than the white, and is a wine of much the same character as the white.

Of the Golden Concord and sparkling wine the committee can only say that it is a sweet, pleasant, light, sparkling wine that may be adapted to some tastes, but was not a wine that would rank high for quality.

The committee, taking the number 100 as the highest mark of quality, have given the following standard to these wines:

John Reisig's Norton's Virginia.....	85
Pointe aux Peaux Company's Virginia.....	65
Pointe aux Peaux Company's White Concord.....	80
Monroe Company's White Concord.....	65
Pointe aux Peaux Catawba of 1871.....	75
Pointe aux Peaux Delaware of 1870.....	85
Monroe Company's Red Concord of 1873.....	70
Monroe Company's Golden Concord.....	50

The committee are fully impressed with the excellent showing that these wines made for the quality of the grapes grown in this district, and infer that the soil does much to make the Norton's Virginia and the Concord so high in quality.

R. F. JOHNSTONE, of Detroit,
ADDISON KELLY, of Kelly's Island,
B. DANSARD, of Monroe,

Committee.

REPORT OF COMMITTEE ON FRUITS.

The Committee on Fruit beg leave to make the following report:

We find on the tables a remarkably fine display of well selected and superior varieties of fruit, and, what is more remarkable, they are all, or nearly all, correctly labeled—proving to us the good influence of your Society in educating the people to know correctly the names of the different varieties of fruit on exhibition. Considering the season, this is a better display than we expected to see.

There are also a few fair vegetables for so early in the season.

We find on the tables superior specimens of the following varieties of apples: Wagener, Red Canada, and especially we considered the fine specimen of King of Tompkins County remarkable for this season of the year, exhibited by George Parmelee, Grand Traverse County.

By J. N. Davenport, of Monroe, four plates of Tulpehocken,—fine for the season.

L. Bisbee, Monroe, seedling apple, past its prime.

P. G. Sheffer, South Bend, fine specimens of Red Canada.

George Weltz, Wilmington, Ohio, specimens of the Clinton seedling peach, ripe.

H. E. Bidwell, South Haven, Mich., fair specimens of St. Germain pears.

Agricultural College, 20 varieties of strawberries, correctly labeled, a large and fine display.

H. P. Chapman, Reading, Downer and Wilson strawberries,—fair.

Jeremiah Brown, Battle Creek, President Wilder,—extra fine.

Henry Weamer, Clinton county, extra fine Jucunda.

E. R. Haigh, South Haven, fine display of 8 varieties; extra fine Bidwell.

R. A. Law, South Haven, 10 varieties; fine display.

Mrs. H. D. Haskell, Monroe, Downer's late and Hooker's,—fine berries.

J. M. Randall, Adrian, Green Prolific,—look well.

H. E. Bidwell, South Haven, fine display of cherries,—a new variety called the Rockport.

Luther Bisbee, Monroe, fine collection of cherries,—Ox Heart, Yellow Spanish, Black Tartarian, Early White Heart and Imperial Morello.

Unknown—Yellow Spanish, Imperial Morello, Black Tartarian, Early White Heart.

J. W. Davis, Monroe, Early Rose potatoes, fine stalk of tomatoes, good specimens of corn for the season.

John Greening, Monroe, turnip, beets, carrots, kohl-rabi, fine currants, strap-leaf turnips,—good display.

H. D. Haskell, Monroe, Early Russian cucumber, peas, cherry currants.

A very fine display of dried fruit, exhibited by S. G. Sheffer, agent of H. E. Bidwell, of South Haven.

D. C. RICHMOND,

Chairman of Committee.

Col. Richmond, after reading the above report, made some complimentary remarks concerning the beautiful appearance of Monroe city, the hospitality shown, and expressed his unqualified surprise at the soil and its adaptability to fruit growing. He closed his remarks with an urgent appeal to the people of Monroe to take care of the old pear trees, and make them last as long as possible.

The committee on resolutions, to which was committed the duty of expressing the sense of the society in connection with the meeting held at the city of Monroe, reported the following preamble and resolutions:

WHEREAS, The Michigan State Pomological Society has held its summer meeting for 1875 at the city of Monroe, and this meeting has proved one of the most useful and encouraging in developing the utility of the society, and in making known the large nursery, fruit, and wine interests of the vicinity, and

WHEREAS, Much of this success is due to the liberal action and generous energy of the citizens of Monroe, and the warm and enthusiastic spirit with which they have welcomed the society, and aided in its efforts to perform the duties incumbent upon it in promoting all the interests of horticulture; therefore,

Resolved, That the thanks of the society are due and hereby tendered to the officers and members of the Monroe County Agricultural Society for the invitation which has secured to the pomologists of the State one of the most useful and agreeable conventions yet held.

Resolved, That the society hereby tender its most sincere thanks to the Hon. H. J. Redfield, mayor of Monroe, and to Jarvis Eldred, city marshal, for the use of the City Hall, and for the preparations made by the city authorities for the accommodation of the society.

Resolved, That it is the duty of this society to express its most heart-felt gratitude and its most sincere admiration for the generous hospitality of the citizens of Monroe, and the thorough and perfect manner in which they have given it a reception which has been a gratification to every member, as exhibiting a complete appreciation of the efforts made to advance the interests of pomology.

Resolved, That it is with sincere pleasure that we have welcomed to this meeting a delegation from the State Horticultural Society of Ohio, representing a sister society animated with designs the same as our own, and that we hope by a return of the courtesy to more fully express a sense of our obligations to our Ohio brethren.

Resolved, That the vocal and instrumental music so freely and fully provided, and contributing so fully by its fine execution and its high quality to the enjoyment and pleasure of the members and visitors, deserve our most sincere acknowledgments. Our thanks are therefore especially and particularly tendered to the ladies,—Mrs. P. B. Loranger, Mrs. C. Baldwin, Mrs. F. B. Lee, Miss Mary Northrop, Miss Nellie Reynolds, Miss Matilda Meyerfeld, Miss Sarah Meyerfeld, Miss Sarah Little, and to Messrs. L. N. Reynolds and M. Paulding.

Resolved, That the society hereby present its especial thanks to the Flint & Pere Marquette Railroad Company for the facilities which it has offered the members of the society, and for the generous liberality with which it always promotes the objects of the State Pomological Society.

Resolved, That for the courtesies and display tendered by the officers and members of the River Raisin Navy, we tender our sincere acknowledgments, and in return hope that the naval organization may ever be able to represent Monroe with credit, both on sea and land.

R. F. JOHNSTONE,

Chairman.

On motion, the resolutions were unanimously adopted.

The secretary called attention to the invitation of the River Raisin Navy, which had been extended to the society, to witness a review of the navy at 2½ o'clock P. M., and stated that carriages would be provided for those who would attend, to ride to the docks.

During the sessions H. Dale Adams of Kalamazoo acted as treasurer, and we noticed that portions of the time he was kept quite busy in taking in cash for memberships and in making out certificates therefor.

At 2½ o'clock P. M., carriages being provided, many visitors and a large number of Monroe people repaired to the docks to witness the review of the River Raisin Navy. The navy made a fine appearance, turning out with one six and one four-oared barge, four four-oared shells, two double sculls and one single scull. They passed in review up and down the river several times. The two double sculls rowed over a three-quarter mile course together, making a very even race, though not remarkably exciting.

Another party of visitors, including some of our Ohio friends, were taken in carriages to Pointe aux Peaux, to examine the vineyards there and to view the beauties of the place, and had a very pleasant and enjoyable afternoon.

After the races a steam yacht conveyed the party down the beautiful river Raisin, past the Hunter's Happy Home, past the lighthouse out into Lake Erie for a few miles, and brought all back perfectly satisfied that Monroe for beauty of location, for pleasantness of surroundings, for the hospitality of her people, for vineyards that produce wines as generous of spirit as her citizens, for nurseries that are capacious and extended, and beautiful, accomplished women and happy-hearted men, it is the very Gascony of Michigan, combining all the vivacity and *esprit* of the Champagne with the enthusiasm and warmth of the Marseillaise. We quote from Rabelais and say, "*Vogue la galere!*"—row while you may! *Au revoir!*

THE TREASURER'S REPORT.

EXTRACTS FROM THE REPORT OF THE TREASURER, READ AT THE
IONIA MEETING, DECEMBER, 1874.

To the President, Executive Committee and Members of the Society :

At Battle Creek, in December, 1873, the financial situation of the society was represented to be prosperous, though not in a condition that was entirely satisfactory. The society was then in debt to its life membership fund, which had been exhausted for premiums and current expenses. It was there and then believed to be unwise policy to use this fund for any purpose. A representation of the facts, and of the condition of the society, was made to the executive board of the State Agricultural Society at its winter session, 1874, held at Eaton Rapids, and that board very generously listened to the appeals of our representatives, and voted our society \$1,000 to pay its debts. This liberal and just action of the State Agricultural Society immediately relieved the necessities of our society, and I am able to report to this annual meeting of 1874, all premiums paid, nearly all expenses paid, and a life membership fund instituted and invested amounting to \$700. For a detailed statement of receipts and expenditures up to the first of February, 1874, I beg to refer you to the printed report of 1873. Since that date our transactions are represented in the following

SUMMARY OF RECEIPTS AND EXPENDITURES.

Michigan State Pomological Society in account with Henry Seymour, Treasurer.

1874.		RECEIPTS.	
Feb. 1.	By balance on hand from last report.....		\$220 34
Nov. 15.	By annual membership.....		214 00
“	By thirty-seven life memberships.....		370 00
“	By amount received from State Agricultural Society for expenses State fair.....		300 00
“	By checks on A. J. Dean for premiums on essays and orchards.....		120 12
“	By amount of life membership fund collected and paid in.....		300 00
“	By interest on same, eight months and twenty days.....		21 66
“	By amount received from James Vick, and for sale of fruit, paper and stamps.....		40 85
Total receipts from February 1, 1874, to November 15, 1874.....			\$1,586 97

1874.		EXPENDITURES.	
Nov. 15.	To loan of life membership fund on bond and mortgage at 10 per cent..	\$500 00	
"	To loan of life membership fund on call at 10 per cent.....	200 00	
"	To paid secretary.....	320 00	
"	To paid orchard premiums.....	110 00	
"	To paid expenses orchard committee.....	82 84	
"	To paid premiums for 1872 and 1873.....	32 50	
"	To expenses treasurer at Adrian, at State fair, at Spring Lake, etc.....	35 08	
"	To expenses executive committee.....	30 50	
"	To James Cox, clerk at fair.....	30 00	
"	To Webster, clerk at fair.....	19 50	
"	To B. B. Rice, deputy superintendent at State fair.....	18 00	
"	To W. S. George & Co. for strawberry cuts for reports.....	15 50	
"	To John J. Thomas of Union Springs, N. Y., expenses at Adrian meeting	25 10	
"	To G. M. Hasty, deputy secretary of State, for boxes for reports.....	36 72	
"	To express on books received and exchanged.....	11 65	
"	To expense secretary—postage, express, freight, telegraphing, attending Michigan State fair, making annual report, etc.....	80 00	
"	To expenses C. J. Dietrich, deputy secretary at Adrian meeting.....	13 00	
"	To printing, Waters & Lee, Spring Lake meeting.....	21 00	
"	To sundry expenses at State fair,—recording mortgage, freight, printing, badges, wrapping paper, twine, etc.....	26 54	
Total loans and expenditures from Feb. 1 to Nov. 15, 1874.....		\$1,607 93	

RECAPITULATION.

Total receipts from February 1 to November 1, 1874.....	\$1,586 97
Total expenditures from February 1 to November 15, 1874.....	1,607 93
Overdrawn and due treasurer.....	820 96

THE PAYMENT OF PREMIUMS.

The amount of \$1,200 was given the society by the State Agricultural Society for premiums. The Pomological Society exhibited in union with the State Agricultural Society, and the latter society received all moneys at the gates and paid the premiums. These premiums were paid by checks drawn by Secretary Thompson on A. J. Dean, treasurer of the State Agricultural Society, who paid them on presentation and at sight. The checks were drawn on Saturday, the last day of the State fair, and the exhibitors were greatly pleased at the promptitude of payment by Treasurer Dean. This system of paying premiums worked well and to the entire satisfaction of exhibitors, many of whom received their money on the spot. The amount of checks so drawn was \$1,198.50.

THE LIFE MEMBERSHIP FUND.

It has been a subject of profound thought with the friends of horticulture in Michigan how to establish this interest on a permanent and enduring basis. This interest, one of the great industries of the State, representing millions of dollars in orchards, vineyards, gardens, nurseries and ornamental grounds, must have its State and local societies, its exhibitions, fairs, libraries, periodicals and annual reports. To provide all these, the necessary funds have to be raised, and prizes and premiums must be given for the best varieties and cultivation.

But it should be recollected that a society of this kind, representing one branch or specialty of a general system of agriculture, is very likely to be of an ephemeral character unless it provides funds wherewith to sustain itself in years of panic, lukewarmness, or disaster. With this view the executive com-

mittee instructed the treasurer to invest the receipts for life memberships at 10 per cent. interest, and this has been done to the amount of \$700. This is a small commencement.

LIST OF LIFE MEMBERS OF THE MICHIGAN STATE POMOLOGICAL SOCIETY.*

Edward Bradfield, Ada, Kent county.
 A. J. Cook, Lansing, Ingham county.
 G. W. Dickinson, Grand Rapids, Kent county.
 C. J. Dietrich, Grand Rapids, Kent county.
 A. S. Dyckman, South Haven, Van Buren county.
 S. L. Fuller, Grand Rapids, Kent county.
 T. W. Ferry, Grand Haven, Ottawa county.
 W. D. Foster (deceased), Grand Rapids, Kent county.
 George W. Griggs, Grand Rapids, Kent county.
 J. W. Humphrey, Plymouth, Wayne county.
 F. J. Littlejohn, Allegan, Allegan county.
 A. T. Linderman, South Haven, Van Buren county.
 E. H. Reynolds, Monroe, Monroe county.
 H. G. Reynolds, Old Mission, Grand Traverse county.
 W. B. Ransom, St. Joseph, Berrien county.
 Asa W. Slayton, Grattan, Kent county.
 G. W. Stanton, Grand Rapids, Kent county.
 Hunter Savidge, Spring Lake, Ottawa county.
 Will. W. Tracy, Old Mission, Grand Traverse county.
 H. G. Wells, Kalamazoo, Kalamazoo county.
 John J. Bagley, Detroit, Wayne county.
 S. O. Knapp, Jackson, Jackson county.
 R. C. Kedzie, Lansing, Ingham county.
 W. J. Beal, Lansing, Ingham county.
 S. O. Pearsoll, Alpine, Kent county.
 H. Dale Adams, Galesburg, Kalamazoo county.
 C. P. Avery, Old Mission, Grand Traverse county.
 F. S. Sleeper, Galesburg, Kalamazoo county.
 T. T. Bates, Traverse City, Grand Traverse county.
 Perry Hannah, Traverse City, Grand Traverse county.
 J. B. Haviland, Traverse City, Grand Traverse county.
 W. H. C. Mitchell, Traverse City, Grand Traverse county.
 H. W. Curtis, Old Mission, Grand Traverse county.
 E. U. Knapp, Grand Rapids, Kent county.
 Wm. A. Marshall, Old Mission, Grand Traverse county.
 A. K. Montague, Traverse City, Grand Traverse county.
 J. B. Soule, Fruitport, Muskegon county.
 Thomas Petty, Spring Lake, Ottawa county.
 Wm. Johnson, Vassar, Tuscola county.
 I. E. Ilgenfritz, Monroe, Monroe county.
 H. B. Chapman, Reading, Hillsdale county.
 J. Dyckmann, East Saginaw, Saginaw county.
 Nathaniel Chilson, Battle Creek, Calhoun county.
 John Gilbert, Ovid, Clinton county.
 A. S. Dixon, East Saginaw, Saginaw county.
 David Geddes, Saginaw, Saginaw county.
 F. S. Sterling, Monroe, Monroe county.
 D. Forsyth Rose, East Saginaw, Saginaw county.
 L. M. Mason, East Saginaw, Saginaw county.
 E. J. Shirtz, Shelby, Oceana county.
 J. C. Zeigler, Saginaw City, Saginaw county.
 J. M. Sterling, Monroe, Monroe county.
 S. P. Williams, Monroe, Monroe county.
 Caleb Ives, Monroe, Monroe county.
 W. A. Noble, Monroe, Monroe county.

*NOTE.—A life membership is \$10. This fund is invested at 10 per cent interest. The principal is not touched: the interest only is used.

J. C. Sterling, Monroe, Monroe county.
 Wm. C. Sterling, Monroe, Monroe county.
 George Parmelee, Old Mission, Grand Traverse county.
 T. T. Lyon, South Haven, Van Buren county.
 James D. Husted, Lowell, Kent county.
 N. P. Husted, Lowell, Kent county.
 John Suttle, Grand Rapids, Kent county.
 M. S. Crosby, Grand Rapids, Kent county.
 E. H. McCallum, Old Mission, Grand Traverse county.
 Antoine Wier, Monroe, Monroe county.
 Thomas Doyle, Monroe, Monroe county.
 E. T. Smith, Ionia, Ionia county.
 George W. Bruckner, Monroe, Monroe county.
 John C. Greening, Monroe, Monroe county.
 Mrs. George Parmelee, Old Mission, Grand Traverse county.
 J. P. Thompson, Cascade Springs, Kent county.
 James Vick, Rochester, New York State.
 Mrs. David H. Jerome, Saginaw City, Saginaw county.
 A. J. Dean, Adrian, Lenawee county.
 L. F. Bragg, Kalamazoo, Kalamazoo county.
 J. M. Stearns, Kalamazoo, Kalamazoo county.
 T. R. Renwick, Grand Rapids, Kent county.
 N. E. Smith, Ionia, Ionia county.

EXPLANATION.—It will be noted that the above list includes seventy-eight names, and we have but \$700 invested. In the early history of the society the receipts for life membership were used and paid out for premiums and current expenses. I would recommend that an amount sufficient to balance the indebtedness of the society to this fund be appropriated whenever the funds of the society will admit of such an adjustment, so that this fund shall represent every life membership taken from the foundation of the society.

In order to take counsel of others who had passed through a similar experience,—the life beginning,—a letter was addressed to the secretary of the Massachusetts Horticultural Society, to which was received the following answer:

Boston, November 7, 1874.

DEAR SIR:—Mr. Rand, our recording secretary, has placed in my hand yours of the 2d inst., which I hasten to answer as well as I can. It is a difficult matter to give a history of our Massachusetts Horticultural Society. It would take more ink than I now have to spare, but is being written up by our editor for publication at some future time. I can only say that we began, as do most other similar institutions, *in a small way*, and, like Topsy, have "grewed!"

Our funds are mainly the result of fortunate investments in real estate, until we are now the happy possessors of a home, worth in the market *three hundred thousand dollars*, and more beautiful and comfortable than that of any similar institution in the world, and a library acknowledged to be also the best. I send you by this mail our current publications, and if you will look at my account as treasurer, you will see where our money comes from, and *where it goes to* also. The catalogue of library does not represent the worth of it. Since that publication, we have added full twenty per cent to its value by the purchase of rare old works. Do not think me boastful. I mean to state only facts, and I think you would warrant them if you were to visit us and see for yourself.

You ask if the State does anything for us? Yes: it did charter us many years ago, and now it makes us pay *awful taxes* (*vide* treasurer's report); nothing more. We have to fight our own battles.

I send you a copy of our by-laws, that you may see how we are governed, and also a schedule of prizes, that will tell you of our exhibition. Number 1 of this year's Transactions gives a report of discussions in the spring. They were discontinued in the summer, and just now resumed.

We rejoice in the establishment of sister societies all through the land. A great work is now being done in that direction, and we shall be glad to know of your prosperity, even if greater than ours.

Please accept our thanks for your invitation to visit you. We cordially reciprocate all such favors in their fullest meaning. I for myself promise, when I get so far west, to avail myself of your kind hospitality.

Respectfully and kindly yours,

E. W. BUSWELL,

Treas. and Cor. Sec'y.

CONCLUDING REMARKS.

This example of the Massachusetts Horticultural Society has been adduced, not with the expectation that we shall immediately be able to adopt its system of premiums and prizes, but with the desire that we may imitate the example so far as we can, and approximate as near as possible to a judicious system of investment that will provide, in part, for the wants of the future.

In the meantime it is the duty of the society to provide the necessary means to defray the ordinary and necessary current expenses. We need \$200, immediately, to bring us out to the first of January, at which time I will submit a full statement for the year.

HENRY SEYMOUR,

Treasurer.

Grand Rapids, November 19, 1874.

SUPPLEMENTAL REPORT FOR DECEMBER, 1874.

1874.		EXPENDITURES.	
		To balance due treasurer brought forward.....	\$20 96
Dec.	2.	To balance paid secretary of State, boxing books.....	5 42
"	2.	To expenses of treasurer.....	8 75
"	2.	To paper and postage.....	2 00
"	7.	To paid secretary.....	80 00
"	7.	To life membership fund loaned on call at 10 per cent.....	100 00
"	10.	To express on books.....	35
"	14.	To postage for secretary.....	15 00
			<u>\$232 50</u>
1874.		RECEIPTS.	
Dec.	3.	By 42 annual members at Ionia.....	\$42 00
"	3.	By 11 life members at Ionia.....	110 00
"	31.	By 1 annual member,—R. A. Law.....	1 00
"	31.	By balance due treasurer, charged in new account for 1875.....	79 50
			<u>\$232 50</u>

It will be seen that there was due the treasurer \$79.50 on the 1st of January, 1875.

ADDITIONAL LIFE MEMBERS.

Hampton Rich, Ionia, Ionia county.

W. P. Burham, " "

Frederick Hall, " "

Geo. W. Webber, " "

Geo. S. Cooper, " "

E. P. Kelsey, " "

W. D. Arnold, " "

Alonzo Sessions, " "

J. H. Kidd, " "

William Sessions, " "

C. E. Rust, " "

B. Hathaway, Little Prairie Ronde.

H. P. Hanford, Bristol, Indiana.

Judge Munroe, South Haven, Van Buren county.

REMARKS BY TREASURER.

GENTLEMEN:—It will be seen from the above report that the life membership fund January 1st, 1875, amounted to \$800,—\$500 on bond and mortgage, and \$300 on call, at 10 per cent interest. The citizens of Ionia and of Grand Traverse are especially to be remembered for this increase. A number of premiums were also paid in life memberships, and the money was thus diverted to this fund, and by good management this fund can annually be increased in this way. The amount received for life memberships was \$480.

The active, working and ready officer of this society is expected to be the secretary. It will be noticed that Secretary Thompson has managed the expenditures of his office with much economy. The extensive correspondence of the office, the preparation of the annual report and premium list, the appointment and details of the meetings, including the annual fair, all involve expenditure for postage, stationery, telegrams, etc. The attendance at the meetings and at the fair involve traveling expenses, hotel bills, express and freight bills for exchanges on books and the transmission of illustrations and copy for the annual report. All of these expenditures, included in the above report, only amount to \$95. There is probably no society in the State that gets its work accomplished, and so much of it, at so cheap a rate.

It will also be noticed that the expenses of the Executive Committee have been but a trifle, amounting to \$30 50, the members of the committee choosing to pay their own bills, thereby donating their time, services, and expenses to the Society. I paid in 1874 \$42 16 for boxes for annual report of Secretary, and the work of boxing, at Lansing. As I remarked in my report of 1873, this expense is one that could well be paid by the State.

The expenses of the Orchard Committee for 1874 have been heavier than for any previous year, amounting to about \$100. The work of the committee has been more extended than any previous year, reaching all parts of the State. The useful and beneficial character and influence of this committee justifies all the expense, which was only for necessary travel and railroad bills.

It will be noticed that a small amount of old premiums for 1872 and 1873 have been paid. Though these were barred, by the rule of the Society, it was deemed best to pay them, so that it could be said that the Society paid all its premiums. It has ever been our aim to pay every cent due exhibitors, though it will happen that occasionally one is overlooked in adjusting premiums. In previous years exhibitors have in a few instances donated their premiums; at the fair of 1874 not one cent of premiums was donated, which illustrates the fact that fairs feel the financial stringency as well as any other business enterprise.

In closing this report I cannot refrain from saying a word respecting the policy of the State Agricultural Society toward this Society. That policy is growing more liberal, and the fruits of it are seen in the quickened activity that pervades horticultural affairs throughout the State. The State Agricultural Society can take a share of credit for the success of our fairs, for the usefulness of our committees, and for the great interest manifested at our meetings. That mother society is doing a great and good work in the aid which it gives the younger and feebler Pomological Society. I sincerely hope that this aid and assistance will be continued, and that the two societies will act in union and harmony together for many prosperous years, to the great advancement of the best interests of Michigan Agriculture.

HENRY SEYMOUR, *Treasurer.*

Grand Rapids, January 1, 1875.

OFFICERS FOR 1875.

OFFICERS OF THE STATE POMOLOGICAL SOCIETY FOR 1875.

PRESIDENT—GEORGE PARMELEE, Old Mission, Grand Traverse County.

TREASURER—HENRY SEYMOUR, Grand Rapids, Kent County.

SECRETARY—J. P. THOMPSON, Cascade, Kent County.

VICE PRESIDENTS.

PERRY HANNAH, Grand Traverse County.
HENRY HOLT, Kent County.
JOHN GILBERT, Clinton County.
J. C. HOLMES, Wayne County.
J. P. BARNES, Shiawassee County.
W. J. BEAL, Ingham County.
E. J. SHIRTS, Oceana County.
I. E. ILGENFRITZ, Monroe County.
G. W. TOLES, Berrien County.
B. G. BUEL, Cass County.
T. J. RAMSDELL, Manistee County.
LYMAN HALL, Ottawa County.
FREDERICK HALL, Ionia County.
J. WEBSTER CHILDS, Washtenaw County.
G. W. PHILLIPS, Macomb County.
S. B. PECK, Muskegon County.
JAMES SATTERLEE, Montcalm County.

D. W. WILEY, Allegan County.
A. C. PRUTZMAN, St. Joseph County.
C. W. GREENE, Oakland County.
C. ENGLE, Van Buren County.
ARTIMUS SIGLER, Lenawee County.
H. B. CHAPMAN, Hillsdale County.
D. T. FOX, Kalamazoo County.
CHARLES MERRITT, Calhoun County.
S. O. KNAPP, Jackson County.
A. McPHERSON, Livingston County.
WM. H. C. LYON, Genesee County.
DAVID GEDDES, Saginaw County.
WILLIAM JOHNSON, Tuscola County.
RALPH ELY, Gratiot County.
Mr. NOBLE (of the firm of Dexter & Noble),
Antrim County.

EXECUTIVE COMMITTEE.

G. W. BRUCKNER, Monroe, 1 year.
S. O. KNAPP, Jackson, 1 year.
N. CHILSON, Battle Creek, 2 years.

A. J. COOK, Lansing, 2 years.
WILLIAM L. WEBBER, East Saginaw, 8 years.
D. R. WATERS, Spring Lake, 8 years.

Ex Officio.

The President, GEORGE PARMELEE, elected annually.
The Treasurer, HENRY SEYMOUR, elected annually.
The Secretary, J. P. THOMPSON, elected annually.

EXECUTIVE SUPERINTENDENTS OF FAIR.

GENERAL SUPERINTENDENT—WM. L. WEBBER, East Saginaw.
ASSISTANT SUPERINTENDENT—G. W. BRUCKNER, Monroe.
SUPERINTENDENT OF APPLES—A. J. COOK, Lansing.
ASSISTANT SUPERINTENDENT OF APPLES—H. DALE ADAMS, Galesburg.
SUPERINTENDENT OF GRAPES AND OTHER FRUITS—N. CHILSON, Battle Creek.
ASSISTANT SUPERINTENDENT OF GRAPES AND OTHER FRUITS—J. C. STERLING, Monroe.
SUPERINTENDENT OF FLORAL DEPARTMENT—S. O. KNAPP, Jackson.
ASSISTANT SUPERINTENDENT OF FLORAL DEPARTMENT—D. R. WATERS, Spring Lake.

NOTE.—The first meeting of the Society was held February 26, 1870, at Grand Rapids, when Articles of Association were adopted. A reorganization was perfected July 5, 1871, under the provisions of the act of the Legislature approved April 15, 1871.

OFFICERS OF THE MICHIGAN STATE AGRICULTURAL SOCIETY FOR 1875.

PRESIDENT—E. O. HUMPHREY, Kalamazoo.

SECRETARY—C. F. KIMBALL, Pontiac.

TREASURER—A. J. DEAN, Adrian.

EXECUTIVE COMMITTEE.

Terms Expire December 31st, 1875.

EDWIN PHELPS, Pontiac, Oakland County.
 J. Q. A. BURRINGTON, Worth, Tuscola County.
 F. M. MANNING, Paw Paw, Van Buren County.
 J. P. ALLISON, East Saginaw, Saginaw County.
 E. VAN VALKENBURGH, Hillsdale, Hillsdale Co.
 ABEL ANGEL, Bradley, Allegan County.
 D. W. HOWARD, Pentwater, Oceana County.
 H. O. HANFORD, Plymouth, Wayne County.
 J. WEBSTER CHILDS, Ypsilanti, Washtenaw Co.
 D. A. BLODGETT, Hersey, Osceola County.

Terms Expire December 31st, 1876.

GEORGE W. PHILLIPS, Romeo, Macomb Co.
 E. W. RISING, Davison Station, Genesee County.
 JOSEPH M. STERLING, Monroe, Monroe County.
 C. W. GREENE, Farmington, Oakland County.
 WILLIAM M. FERRY, Grand Haven, Ottawa Co.
 N. L. AVERY, Grand Rapids, Kent County.
 A. O. HYDE, Marshall, Calhoun County.
 C. L. WHITNEY, Muskegon, Muskegon County.
 J. M. FRENCH, Detroit, Wayne County.
 J. G. RAMSDELL, Traverse City, Grand Traverse Co.

HONORARY MEMBERS OF COMMITTEE.

JAMES BAILEY, Ex-President, Birmingham, Oakland County.
 H. G. WELLS, Ex-President, Kalamazoo, Kalamazoo County.
 CHARLES DICKEY, Ex-President, Marshall, Calhoun County.
 C. C. MONROE, Ex-President, Jonesville, Hillsdale County.
 M. SHOEMAKER, Ex-President, Jackson, Jackson County.
 W. G. BECKWITH, Ex-President, Cassopolis, Cass County.
 W. J. BAXTER, Ex-President, Jonesville, Hillsdale County.
 GEO. W. GRIGGS, Ex-President, Grand Rapids, Kent County.
 CHARLES KIPP, Ex-President, St. Johns, Clinton County.

STANDING COMMITTEES.

ON BUSINESS—J. M. STERLING, A. O. HYDE, N. L. AVERY.
 ON FINANCE—G. W. PHILLIPS, A. O. HYDE, E. W. RISING.
 ON PRINTING—E. O. HUMPHREY, A. J. DEAN.
 ON PREMIUM LIST—W. G. BECKWITH, J. Q. A. BURRINGTON, H. O. HANFORD, N. L. AVERY,
 EDWIN PHELPS, J. VAN VALKENBURGH.
 ON TRANSPORTATION—W. J. BAXTER, J. M. STERLING.

EXECUTIVE SUPERINTENDENTS.

GENERAL SUPERINTENDENT—W. G. BECKWITH.
 SUPERINTENDENT OF CATTLE—GEORGE W. PHILLIPS.
 SUPERINTENDENT OF HORSES—A. O. HYDE, D. W. HOWARD.
 SUPERINTENDENT OF SHEEP AND SWINE—E. W. RISING, D. A. BLODGETT.
 SUPERINTENDENT OF POULTRY AND MISCELLANEOUS—J. P. ALLISON.
 SUPERINTENDENT OF FARM IMPLEMENTS—H. O. HANFORD, ABEL ANGEL.
 SUPERINTENDENT OF ART HALL—J. W. CHILDS, J. G. RAMSDELL.
 SUPERINTENDENT OF MUSIC HALL—C. L. WHITNEY.
 SUPERINTENDENT OF MANUFACTURING HALL—N. L. AVERY, J. Q. A. BURRINGTON.
 SUPERINTENDENT OF MACHINERY HALL—WM. M. FERRY, C. KIPP.
 SUPERINTENDENT OF AGRICULTURAL HALL—E. PHELPS.
 SUPERINTENDENT OF CARRIAGE HALL—G. W. GRIGGS.
 SUPERINTENDENT OF BOOTHS—F. M. MANNING.
 SUPERINTENDENT OF POLICE AND GATES—J. M. STERLING, A. J. DEAN.
 CHIEF MARSHAL—C. W. GREENE.
 SUPERINTENDENT OF FORAGE—E. W. RISING.
 SUPERINTENDENT OF GRAND STAND—G. C. MONROE.
 CENTENNIAL COMMITTEE—W. J. BAXTER, J. G. RAMSDELL, J. W. CHILDS, WM. M. FERRY,
 C. F. KIMBALL.

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New York Botanical Garden Library



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